R E P O R T R E S U M E S

ED 020 531 CG 001 886

COUNSELING THE TECHNICALLY-ORIENTED STUDENT.
FERRIS STATE COLL., BIG RAPIDS, MICH.

PUB DATE OCT 67

EDRS PRICE MF-$0.50 HC-$2.48 60P.

DESCRIPTORS- COUNSELORS, CONFERENCE REPORTS, *VOCATIONAL COUNSELING, *VOCATIONAL EDUCATION, *TECHNICAL EDUCATION, TECHNOLOGICAL ADVANCEMENT, TECHNOLOGY, *POST SECONDARY EDUCATION,

IN 1967, A SELECTED GROUP OF MICHIGAN SECONDARY SCHOOL COUNSELORS PARTICIPATED IN A WORKSHOP DESIGNED TO PROVIDE--(1) AN OVERVIEW OF THE ROLE OF TECHNICIANS IN MODERN BUSINESS AND INDUSTRY, (2) CURRENT DATA ON THE NEEDS FOR TRAINED TECHNICIANS, (3) AN OPPORTUNITY TO REVIEW TECHNIQUES OF VOCATIONAL COUNSELING AND GUIDANCE AS THEY RELATE TO STUDENTS INTERESTED IN TECHNICIAN TRAINING, (4) AN INTENSIVE EXPOSURE TO POST-HIGH SCHOOL TECHNICAL PROGRAMS IN OPERATION, AND (5) PROFESSIONAL ASSISTANCE IN DEVELOPING COMMUNITY ACTION PROGRAMS FOR IDENTIFYING, ENCOURAGING, AND COUNSELING STUDENTS WHOSE CAREERS WILL REQUIRE ADVANCED TECHNICAL EDUCATION. THIS COMPILATION OF ADDRESSES AND SMALL GROUP SESSIONS INCLUDES THE FOLLOWING--(1) THE CRUCIAL ROLE OF THE COUNSELOR IN IDENTIFYING AND ENCOURAGING THE TECHNICALLY ORIENTED STUDENT, (2) A PROJECTION OF THE NEED FOR TECHNICIANS IN 1975, (3) TECHNICIAN NEEDS IN MICHIGAN, (4) WHAT EMPLOYERS SEEK IN THE TECHNICIAN, (5) DEVELOPMENTS IN VOCATIONAL-TECHNICAL EDUCATION IN MICHIGAN, AND (6) COMMUNITY ACTION PLANS IN WHICH COUNSELORS CAN BE INSTRUMENTAL. A ROSTER OF COUNSELOR PARTICIPANTS IS APPENDED. THIS PAPER REPRESENTS THE PROCEEDINGS OF THE COUNSELING AND TECHNOLOGY WORKSHOP (FERRIS STATE COLLEGE, BIG RAPIDS, MICHIGAN, OCTOBER 1967). (IM)

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ED020531

SCHOOL BULLETIN, FERRIS STATE COLLEGE
Volume 44, No. 4 Big Rapids, Michigan 49307 October 1967

COUNSELING The Technically-Oriented STUDENT

Proceedings of the

Counseling & Technology Workshop

Conducted At Ferris State College

CG 001 886

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Introduction

Despite the fact that technology careers are expanding at a more rapid rate than any other segment of the nation's work force, students are not training for and entering these fields in sufficient numbers to meet the demand. This problem is of increasing concern to educational programmers, especially when no immediate solutions are in sight. Many educational specialists will need to attack the situation, and counselors will have a significant role. The program described in this report was developed as a model approach to this crucial and paradoxical problem in contemporary education.

During the two-week period of August 14-25, 1967, a selected group of Michigan secondary school counselors participated in a singular workshop designed to accomplish the following strategic purposes:

Provide an overview of the role of technicians in modern business and industry.

Provide the most current data on the needs for trained technicians.

Provide an opportunity to review techniques of vocational counseling and guidance as they relate to students interested in technician training.

Provide an intensive exposure to post-high school technical programs in operation.

Provide professional assistance in developing community action programs for identifying, encouraging, and counseling students whose careers will require advanced technical education.

The extensive technical and laboratory facilities of Ferris State College, primarily in its School of Technical and Applied Arts, provided the physical setting for the "Counseling and Technology Workshop." Funding was obtained through several sources, principally the Division of Vocational Education and the Bureau of Educational Services of the Michigan Department of Education, in cooperation with the college.

The major portion of the workshop was devoted to small group sessions comprised of the counselor participants, selected Ferris staff members, and outside consultants. Program planners were extremely fortunate in obtaining nationally prominent consultants who presented a series of addresses open to the public, in addition to their work with the small groups.

Their remarks are of sufficient significance that this compilation has been prepared in order to enable a wider audience to share their

ideas. We hope that it will be of material assistance to others who are interested in the expanding role of the technician.

An innovation in planning for the Counseling and Technology Workshop has provided for a one-day follow-up conference to be held approximately six months later. At this time the original participants will return to the Ferris campus to discuss ideas and action plans which they have attempted in their home communities. In the interim the Workshop Staff has maintained contact with them, providing consultation services when requested. After completion of the follow-up conference, a technical report will be compiled to assess the total effectiveness of the workshop. Copies can be obtained upon request.

Especial appreciation is hereby expressed to the consultants who took time from their busy schedules to appear on the program, to the members of the Ferris staff who cooperated in its operation, to the State Department of Education staff who assisted in making it possible, and to the dedicated counselors who made it all worthwhile through their enthusiastic participation.

The Workshop Staff:

Director, Dr. Malcolm Salinger, Counseling Psychologist, Educational Counseling Center.
Associate Director, John VanderMolen, Academic Counselor, School of Technical and Applied Arts.
Associate Director, Ralph O'Brien, Administrative Assistant to the Dean, School of Technical and Applied Arts.

SCHOOL BULLETIN, FERRIS STATE COLLEGE, Volume 44, No. 4

Published monthly at Big Rapids, Michigan, 49307. Second class postage paid at Big Rapids.

THE CRUCIAL ROLE OF THE COUNSELOR IN IDENTIFYING AND ENCOURAGING THE TECHNICALLY-ORIENTED STUDENT

Kenneth B. Hoyt
Professor of Education and Head
Division of Counselor Education
University of Iowa

This is my first visit to Ferris State College. Part of the reason I wanted to come to Ferris State College, was because I had heard so much about it. I wanted to see how an institution works where you have one-year programs, two-year programs, and baccalaureate programs together all in the same campus, with all of these students living, learning, and working together. This is one of the reasons I wanted to come.

I would like to devote my attention here to some bedrock issues on what we aren't now doing and what we have to start doing to high school guidance programs to meet the needs of students who choose to do something other than go to a four-year college when they leave high school. This concern for these students has been shared by counselors to one extent or another and by public school and vocational educators to some degree or another for a good many years—at least for a professional generation in this field. Yet, we both continue to say that the programs we have are not very good, and we are expressing disappointment that we are not doing more to meet the needs of these students. Something is wrong.

It is becoming, in the last four years, a popular thing, I have noticed, for guidance and vocational education people to get together and tell each other what is wrong. We meet with the vocational education people, and we tell them what is wrong with vocational education. They meet with us in guidance, and they will tell us what is wrong with guidance. I go to very few meetings where anybody tries to turn the thing around and talk about what is right—about the characteristics of a program for vocational aspects of guidance in the secondary school that would make everyone satisfied and supportive of the attempts being made to meet the vocational guidance needs of these students.

Goals of Vocational Aspects of Guidance

When we talk about our objectives in guidance, it seems to me that we begin by recognizing that our basic goals are to help each individual boy and girl with whom we work move toward optimum career development—not occupational choice but career development—through decisions he makes regarding the knowledge, the understanding that he acquires concerning himself and the educational-vocational opportunities which are available to him.

Education has often been pictured in this country as the prime avenue by which man can be made free to be himself and to become what he

decides to become in a free society. This is why we are getting the tremendous support for education that we are getting now in 1967.

Education exists to make a man free, but when we think of that as a goal of American education, we must also recognize, it seems to me, that the results of educational decisions inevitably involve a restriction of freedom. Once he has decided, he is not as free as he was before. Therefore, the decisions that he makes are of key importance to the individual making them, and to the total society of which he is a part. We want, in this movement of ours, to maximize both the number and the quality of educational and vocational alternatives from which our students can choose. We also want to provide the student with the greatest possible assistance in helping him choose wisely from among the alternatives available to him at any particular time.

Our concern then, as counselors for any program of vocational education or any program of vocational guidance, must and does grow out of our concern for the individual. It has no other basis. This is why we exist. And so, we come back to the goal of education—to make man free. For education to make man free, it seems to me, obvious that man must be free to choose education. Otherwise, education cannot possibly make him free.

Vocational education represents one part of education designed to help make man free. Vocational guidance, the job of the counselor, represents that part of education designed to help individuals to be free to use education as a means of becoming free. This is our relationship with vocational education.

Vocational education at both the high school and the post-high school level provide a means of making man free through expanding the numbers and kinds of alternatives from which he can choose. That is why we have it in the school. This objective, which forms the basis of justification for the existence of vocational education, cannot be realized fully or even very completely unless people are free to choose this as an alternative and unless, in fact, some do choose this as an alternative.

Vocational aspects of guidance then, in this sense, represent an essential ingredient in attainment of the benefits which vocational education hopes to give individuals in this country. Vocational aspects of guidance are this important and are this basic to all of what we are trying to do with the current emphasis on both high school and post-high school programs of vocational education to meet the changing needs of people in these changing times.

I think that it is not unrealistic to begin this conference by pointing out the seriousness of the charge which we have accepted when we say we will be counselors. We have accepted some serious societal responsibilities and some serious responsibilities within the family of professional educators by asserting this as our involvement with freedom.

Now, I think we have to get some agreement within the guidance movement first, then with vocational educators, then with the rest of the school, then with the community, regarding these kinds of goals. We have to agree on where we are trying to go. Otherwise, we will never know when we get there or if we ever get there. This, to me, is why we have guidance, why we have vocational education, why we have the rest of the educational programs, and this is what we are trying to do.

ELEMENTS IN A WORKABLE PLAN OF VOCATIONAL GUIDANCE

Now, I would like to devote the major portion of my time talking about the essential elements in a workable plan of vocational guidance. I want to talk mainly about six or seven such elements in terms of the job to be done. I won't talk about them in terms of specific techniques or procedures for accomplishing this. This I would regard as appropriate for other parts of this workshop. If we can get some agreement now on what it is we are trying to learn, then we perhaps will have set the stage for detailed discussions in the next two-week period.

Assumptions of Growth and Development

The first thing I would look for in a workable program of vocational guidance is this: The program that works is one developed on principles of continuing growth and development, rather than being crisis or choice-point oriented in its basic nature. It is a continuing, developmental program, not remedial in its basic nature. In any particular educational setting, the vocational guidance program builds on guidance in previous educational settings. This is where the elementary school guidance is coming in now, and it builds towards guidance in later settings. This is our relationship with counselors at places like Ferris, and so forth. A high school program that works, clearly identifies those parts and those stages of individual career development towards which it can make a maximum contribution without pretending for one minute that either the beginning or the end of career development will be included in what we do in the high school. It began quite a while before these students came to us, and it is going to continue quite a while after they leave us. We represent a period in time for these youth—and that is all.

I want to specify this concept as being essential for the development of specific, assessable goals for the operation of our guidance program in the high school setting. To make this program work demands, I think, that concern and attention be devoted to guidance in other settings as well as in the high school. What can and should be done in the high school is highly influenced by what went on before and what is to go on after. I want us to see where we fit in the total pattern, where our job is, so we can evaluate what we did. We are not the answer. We are one answer to one part. Part of our problem is we haven't identified which part and which answer. That, we have to do.

Total Staff Involvement

Second, the program is built on the assumption that vocational guidance is a responsibility of all professional staff members in the school. Specific responsibilities of specific staff members must be clearly identified and effectively carried out. A program which is built on an assumption that counselors alone can be responsible for its operation is doomed to failure, in my opinion, just as surely as is a program which denies the need for professionally qualified counselors. Either program can do nothing but fail. We have to have counselors, but counselors will never be enough by themselves. The vocational guidance roles of counselors, of teachers, and of administrators are each essential in a workable program of vocational guidance—not merely desirable, but essential.

Commitment to Students

Third, in a workable program of vocational guidance I believe you have a program that is built on assumptions of commitment to students, rather than on assumptions of asking students to commit themselves in any part of education. The only commitment that we ask students to make is a commitment to themselves in terms of the ways in which they behave so as to influence their own growth and development. A workable program is a program that's going to try very hard to help students make wise decisions. At the same time, it's going to try equally hard to allow students maximum freedom to change the decisions that they have made. It doesn't ask students, for example, for a commitment to vocational education. Rather, it asks vocational education for a commitment to students.

A program that works is a program that emphasizes the right of students to try, the right to succeed, the right to fail, the right to try again, and the right to change as each works towards discovering who he is and what he is capable of becoming. This represents a set of inalienable rights of youth in public education. Each is of equal importance.

The Need for Information

Fourth, I think we must have a program that's built on the recognition of both the necessity for and the insufficiency of factual information in decisions students make. I would use both words, necessity and insufficiency. For students to choose wisely from among alternatives demands that they know both the extent and nature of such alternatives—information regarding what the alternatives are and what happens to people who select one as opposed to the other. We are going to have a workable program of vocational guidance as long as we keep from students information about what happens to those who enroll in vocational education.

It has often been said that every student has within himself the capacity to solve his own problems. Because some say so doesn't make

it true. When counselors contend they can help a youngster make wiser decisions than he could make by himself and yet give him no information, I don't understand. I have seen too many cases where we get counselors who are ignorant of alternatives sit down with students who are also ignorant of alternatives. They sit together in a warm, permissive counseling relationship where they share their ignorance. The net result of that kind of relationship, it seems to me, must be the accumulation of a very great body of ignorance. We have to know more than the student knows when he comes to the counselor or we are not going to be able to do our job. We have to be able to expand their horizons. This is my feeling.

At the same time, I think it is equally important to recognize that, in a workable program of vocational guidance, the meaning which information has will vary from student to student. We have to provide assistance to each student in acquiring the unique set of meanings which information has for him. You can talk to one student and tell him his chances of making it through a program are less than one in a hundred, and he'll conclude it isn't very good, and that he ought to try something else. You can say the same thing to the next student and his interpretation will be, "I'm the one in a hundred," and he'll want to try it. This is what I mean when I say the differential information is necessary, but insufficient. Given the information, we have to help youngsters figure out what it means for them. This means we have to have strong programs of real counseling for these students. We are never going to do it with computers, no matter how sophisticated those computer systems get. Those on the strict computer guidance approach right now are going up a blind alley that can never work. Somewhere, we have to have human counselors get together with human kids and talk about the human meaning of education.

Need for a Strong Educational Program

Fifth, if I want to talk about a program of guidance that's going to work, we are talking about a program situated in a school that has strong, viable sets of offerings in both general and vocational education. The student's freedom to choose is arbitrarily limited by the range and quality of the alternatives from which he is allowed to choose. It isn't much of a guidance problem if you have a small high school, call a student in and say to him, "Do you want to take agriculture or home economics?" Most of the boys take agriculture and most of the girls take home economics—and it doesn't take them long to make up their minds. If you are going to let students choose, you have to have something for them to choose from. What we need is a total set of curricular offerings based in some part on the needs of all students, and in other parts on needs of particular portions of the student body. This kind of dual construction of curricular offerings can be said to exist both for general education and for vocational education under ideal circumstances in a school. The guidance program contributes to the curriculum through meeting student needs in both of these areas.

All Student Emphasis

Sixth, if you have a workable program, you have a program that is purposefully designed and operates to meet the needs of all students. This is a very ticklish point at this time with a lot of people in this country. I'd like to be very clear here on my perceptions. The challenge to provide for the changing needs is now. You see, it isn't just the needs. We can't talk about needs in simple, static terms. We have to talk about the changing needs of students because they are changing so fast. The challenge facing us to provide for the changing needs of all students on a continuing basis makes it essential that the vocational guidance program be regarded as part of the total guidance program, just as it makes it essential that the vocational education offerings be regarded as part of a total set of curricular offerings. We don't have the academic and the vocational separated. They are a part of the whole. It is completely inconsistent to separate them if one accepts a commitment to all students—and all of education. If you accept this commitment, it is completely inconsistent to organize a workable program of vocational guidance with some counselors serving the needs of only the vocational education students and other counselors serving the needs of college-bound students. Such a separatist plan precludes the readiness for adaptability on the part of students, which underlines the entire concept of guidance programs and guidance services. The specialty of the counselor can't be vocational guidance or academic guidance or college guidance or scholarships or any other little thing, or this movement is dead. The specialty of the counselor has to be kids. We can't have twelve different kinds of counselors in the school and then expect the student to figure out which one he's supposed to go to. This denies the flexibility, the changing, and the adaptability that is so much a part of every student now, and so much a part of his continuing needs for guidance.

When we say guidance is for all students, then, it must be for all students—from the lowest ability student to the most gifted—from the college bound to the high school dropout—from those who will seek immediate entry into the world of work after leaving high school to those who seek post-high school education. There can be no valid priority, that I can see, for ordering which of these comes first. The tendency that we have had in the high school guidance movement for years and years to meet the needs of college bound first and later the needs of what we call 'the rest' is something we have to get away from. I don't think we need to talk about it very much. We all know this exists. What we need to do is correct it. If you want to talk about types such as the failing student, the dropout, the disadvantaged, the college bound, the slow learner, the gifted, the handicapped, you can do so easily. Then you try to put them in priority order and say which one you are going to counsel first. I would defy any of you to make such a list and justify putting the needs of one ahead of others. Guidance is for all students in a school.

Need for Research

If we have a wrokable program, we have a program that operates on results of local research. As a minimum, we ought to know what happens to students who leave our school. We ought to have follow-up studies of those who leave school, studies of educational opportunities beyond those available in this school or this college. We ought to have studies of our former students who are currently enrolled in other sorts of institutions, studies of occupational opportunities actually and potentially available to those who leave our school, or the further schooling towards which they could head. These bits of information are uniquely important to each unique school and the unique needs of unique students who are in that school. They are not something you are going to get out of an occupational outlook handbook. When we talk about the occupational opportunities available to students in this part of Michigan, it is not the same as talking about the opportunities available to students in this part of Iowa or in another part of Michigan. The width, the breadth, and the depth of vocational education opportunities is pretty unique to unique communities. If you are doing the job right, you are going to have this kind of local research study.

Key Role of Guidance in Vocational Education

Finally, if we are going to have a workable program of vocational guidance, it will not be something that is going to be an ancillary service in vocational education. It will not exist as it is now under the current Vocational Education Act. It will not be something that will be done for seven tenths of one percent of the school operating budget for vocational education, which is the national average of how much money guidance has had from vocational education since the Vocational Education Act was passed. Part of the reason we have not done better on vocational guidance since the Vocational Education Act of '63 was passed is that we have never had sufficient funds to do the job. If we are to do a workable job in high school guidance now, I think we know enough to know that what we need is something between six and eight percent of the total operating budget of that school. That is about what it takes. Now, we have some schools that are up to about twelve percent, but we have a tremendous number that are operating with less than three percent of the total operating budget of that school, and you can't have a workable guidance program like that. You get what you pay for in guidance as well as in anything else.

If we had between six and eight percent of the operating budget, exclusive of physical equipment, maintenance and overhead, we would have enough to provide a full-time counselor for every two hundred fifty to three hundred people. We would have enough for clerical and sub-professional aides in guidance materials. We have never had a period when you could buy so many things to use in the school for vocational aspects of guidance. We have not had sufficient funds put into guidance programs under the Vocational Education Act. This must be changed.

THE NATIONWIDE PICTURE: HOW MANY TECHNICIANS WILL BE NEEDED BY 1975 AND WHERE WILL THEY BE OBTAINED?

Neal H. Rosenthal
Division of Manpower and Occupational Outlook
United States Department of Labor

In Washington, we do a considerable amount of work discussing and writing about technician manpower in our professional literature. I am indeed fortunate to have the opportunity to sit in on sessions such as was held this afternoon to find out how the information that we are producing is being used in the counseling process.

This evening I am going to speak about the national manpower picture for technicians. I will attempt to answer such questions as how technicians obtain their training and how this is changing, what industries employ technicians, and what supply-demand relationships are expected for technicians over the next ten years.

Before presenting information along these lines, I would like to place it in perspective by describing very briefly the basic philosophy of the Bureau of Labor Statistics occupational outlook program--the program with which I am associated and which developed the statistics and information I will present.

The Bureau's occupational outlook program was developed 25 years ago. Its primary task is essentially the same as it was at the time it was conceived. That is, to develop basic, unbiased information on future opportunities in occupations and industries to provide young people with some factual background for an intelligent career choice. We try to prepare and present occupational information in simple terms, unencumbered by the professional terms of the economist or counselor. We are not spokesmen for the vested interests of any occupation, industry, area, school, or educational level. In short, we try to adhere to a basic policy--that of presenting information objectively. This basic philosophy underlies all the work and publications of the outlook program from occupational outlook statements, such as these in the Occupational Outlook Handbook with which most of you are familiar, to such studies as Technician Manpower: Requirements, Resources, and Training Needs which are very complex, detailed, technical studies.

The Bureau's occupational information covers the entire gamut of occupations and industries. It has been our experience that studies of single industries or occupations, or even of groups of occupations and industries--no matter how well done--are not entirely adequate. Whether one is engaged in developing occupational projections, analyzing educational requirements, evaluating job duties, or simply presenting

occupational information, it is essential that occupations be studied and presented from the point of view of their relationship to other, and often all, occupations and industries. We have learned that a parochial, narrow view of opportunities in a single occupation or industry–such as is occasionally held by some professional societies, trade associations, or companies–may result in misleading information. To insure reliability, therefore, the Bureau collects its data from a wide variety of sources to arrive at an evaluation that represents an informed and objective point of view.

Let me turn to the subject at hand–technicians.

Over the past decade, industry, government, and educational institutions have become increasingly aware of the importance of the nation's technical workers. Most of the attention has been focused on scientists and engineers, and there has been a steady flow of information on these workers from a wide variety of sources. Relatively little consideration, however, has been given to technicians–the group of workers very closely associated with engineers and scientists, and who are a vital part of the scientific and engineering team.

The National Science Foundation realized this situation, and in 1964 asked the Bureau of Labor Statistics to conduct a comprehensive study of technician manpower. In response to this request, the Bureau began to study the personal characteristics of technicians, the nature of their work, how they prepare for their jobs, and most important, examined the future requirements, supply, and training needs for these workers with the thorough and detailed work necessary to produce reliable information on future needs and resources of technician manpower. The study was published a year ago, and I think it sheds some much-needed light on this important area of work. I should like to describe some of the major findings of that study.

Let me begin first by describing what we, the Bureau of Labor Statistics, mean when we speak of labor "technicians." As you well know, despite the size and importance of this occupation, there appears to be no generally accepted definition of the term "technician." In the course of our study, we found a wide variety of definitions currently in use, with major differences in who was or was not included within the occupation. Some definitions emphasized education and training, indicating that technicians are those who have graduated from a two-year technical institute type of curriculum or its equivalent. Other definitions emphasized the work performed, generally explaining that technician work falls between professional work done by scientists and engineers and skilled work done by craftsmen. Because of this lack of concensus, an attempt was made in the Bureau's study to provide, not a detailed and explicit definition of who is and who is not a technician, but rather a general description of technician work. The aim of this approach was to develop something that would be understandable to all those concerned, and which might provide a framework for better understanding of technician manpower. Thus, in our report, technicians

are defined basically as "workers who directly or indirectly support scientists and engineers in designing, developing, producing, and maintaining the machines and materials used in our scientific and engineering efforts." Their work is thus technical in nature, but has a practical rather than theoretical orientation.

In general, technicians appear to share one basic characteristic--the ability and knowledge to apply the principles of engineering, mathematics, and science to the solution of technical problems. Although this description still leaves considerable room for improvement, we feel that it nevertheless provides a manageable tool for analysis of the field.

Using this description as a guideline, we found that there were approximately 850,000 engineering and science technicians employed in the United States in 1963. Since numbers in a vacuum tend to be somewhat meaningless, I should like to say that 850,000 is a very, very large number. It is one and one half times the number of nurses employed in 1963 and about 100,000 more than the number of automobile mechanics employed.

It should be stated that medical and dental technicians who work with medical practitioners in the care of patients were excluded from our study.

Technicians can be classified according to the specialty or scientific discipline to which they are most closely related, and we developed four basic groupings: draftsmen; engineering and physical science technicians; life science technicians; and "other" technicians, a miscellaneous group including industrial designers, computer programmers, and surveyors. Engineering and physical science technicians are by far the largest of the four groups, accounting for about one-half of all technicians. Draftsmen make up the second largest technician occupation, with slightly less than one-fourth of all technicians. Life science technicians accounted for about 10 percent of the total, and "other" technicians about 15 percent.

Nearly half of all technicians were employed in manufacturing industries, primarily in the electrical equipment, machinery, chemicals, fabricated metal products, and aircraft and parts industries. About one-fifth were employed in government. Large numbers were also employed in engineering and architectural services, miscellaneous business services, and in the communications industry. Relatively few technicians were found to be employed by colleges and universities or by other nonprofit organizations.

Much of the confusion and disagreement on what constitutes a technician stems from a lack of knowledge of the duties performed by these workers. The Bureau's study found that the major job activity of technicians was the making of drawings, blueprints, or models; about one in three technicians are engaged in this activity. Of course the

relative importance of this activity reflects the large number of draftsmen within the over-all technician group.

Slightly less than one in five technicians are engaged in research and development activities. Other large numbers are engaged in designing or modifying equipment, machinery, or production processes; in supervision; and in inspection. Smaller numbers are engaged in record keeping, quality control, repair and maintenance, and technical services.

Our findings on the personal and educational characteristics of technicians indicate, as we might have expected, that technicians are a relatively young group of workers. The median age of employed technicians was estimated to be about 35 years in 1963; again to place this in perspective, it compares with about 43 years for all workers. There appears to be little difference in the age distribution among the major technician occupational groups, although draftsmen do tend to be slightly younger than other technicians.

One somewhat surprising finding of our study, to many persons, was that technicians have a relatively high level of educational attainment. The median number of school years completed by technicians employed in 1963 was about 14 years, as compared with about 12 years for all workers, and about 16 years for professional workers as a group. Nearly two-thirds of all technicians had some college education, and 1 out of 10 had received a bachelor's degree. Younger technicians have a higher educational level than their older counterparts. It is worth noting that our study found that only a very small proportion of all technicians–about 3 percent in 1963–reported the associate degree to be their highest level of educational attainment. This leaves a great deal of room for expansion.

Despite the relatively high educational level of technicians, only a relatively small proportion are trained specifically for a technician job. Currently employed technicians have acquired the training for their work in many ways, ranging from the completion of a bachelor's degree program in engineering to general acquisition of skills through work experience in technician-related skilled occupations.

Among recent entrants to the field the story is much the same. It is estimated that in 1963 somewhere between 90,000 and 100,000 persons entered technician jobs. Only about half received the training for their job through a formal education training program. Of those with formal training, the largest number–about one-fourth–acquired their training in industry training programs . Technical institutes, junior colleges, and other post-secondary schools provided the training for nearly one out of five new entrants. About one in twenty new technicians received training for their work in colleges and universities, about half having received a bachelor's degree. The number of technicians entering directly from the Armed Forces, surprisingly enough, was quite small, despite the large number of persons with some technician training

separated from the Armed Forces each year. However, many of those separated from the Armed Forces in 1963 may ultimately enter technician jobs after receiving additional training in educational institutions or on the job.

Government training programs, which mostly began in 1962 with the passage of the Manpower Development and Training Act, provided a small number of technicians, although currently many are being trained and in the future many more will receive their training via this method. Insofar as technicians trained in secondary schools is concerned, our findings were that , generally, employers do not believe such training to be either intensive or extensive enough to prepare workers directly for technician jobs. However, many graduates of secondary school technical programs enter technician jobs after further training of some sort.

Although employers prefer to hire technicians with formal training, in recent years, the supply from formal sources has not been sufficient to meet employers' needs. As a consequence, employers have not only initiated many company training programs, but have also upgraded large numbers of workers from other technician-related jobs. Although the gap between the demand for technicians and the supply of those with formal training has been narrowed somewhat through the establishment of industry training programs, in recent years, the greatest number of new technicians have been upgraded from related jobs. The number is believed to represent about half of each year's new entrants. This, of course, means that there is considerable room for expansion of training programs.

Our findings concerning the ratio of technicians to scientists and engineers indicated that there is much discussion about "ideal" or "optimum" ratios of technicians to scientists and engineers. These suggested ratios have ranged from one technician to one scientist or to one engineer, all the way up to eight technicians for every scientist and engineer. In reality, we found that there are only about 65 technicians for every 100 scientists and engineers in the United States, and this relationship has been relatively constant for many years. If draftsmen are excluded, the relationship is only 50 technicians for every 100 scientists and engineers.

Let us now take a look at the Bureau's findings on the future requirements for technicians. Developing projections of the nation's future needs for technicians is no simple task. Nevertheless, utilizing certain basic assumptions about the nature of the economy in 1975, and by relating employment of technicians to projections that we have made for scientists and engineers, we have been able to develop some estimates of requirements for technicians in 1975. This projected growth represents an increase of about three-fourths over the 12-year period, an average rate of increase of about 6.4 percent a year, a rate of growth similar to that which has occurred in recent past. It also represents a rate of growth nearly three times that expected for the labor force as a whole.

Increased requirements for technicians are expected to result from continued economic growth, the increasing utilization of technicians, expanding research and development activities and exploitation of the resulting discoveries especially in the field of medical science, and further slight expansion of the space program.

The most rapid increase in requirements is expected to be for life science technicians. Demand for these workers is projected to increase from the less than 60,000 employed in 1963 to 140,000 needed in 1975, a 139 percent increase over the 1963-75 period. Requirements for engineering technicians, the largest technician specialty, are expected to grow from about 310,000 in 1963 to 535,000 in 1975, or by nearly three-fourths, a rate of increase similar to the rate for all technicians. Because of the relative size of the field, however, more people will be needed to fill openings arising from growing requirements in the engineering technician specialty than in any other specialty. Requirements for draftsmen are expected to increase by about three-fifths, the smallest projected increase of all technician specialties. But again, I should like to point out that this is a much faster rate of growth than that expected for total employment in the United States.

The projections indicate that, between 1963 and 1975, requirements for technicians in several broad industry divisions will increase more rapidly than the rates anticipated for the economy as a whole. These are government, construction, and a miscellaneous group of industries that includes nonprofit organizations, engineering and architectural services, miscellaneous business services, and colleges and universities. In manufacturing, rapid growth of requirements are expected in the chemicals and allied products, rubber products, and professional and scientific instruments industries.

In addition to the 650,000 technicians needed as a result of growth in requirements, about 375,000 will be needed to replace those who retire, die, or transfer to other occupations during the period, or more than one half the number needed for growth. This area of replacement is one which often tends to be forgotten in discussions of manpower needs. In most occupations, replacement needs are of greater importance than growth requirements. Thus, total needs for new technicians are projected at over one million between 1963 and 1975, an average of over 80,000 a year.

What about the other side of the coin--the future supply of technicians? To meet the above requirements, about one million new technicians would be needed over the 1963-75 period. Our projections of supply indicate that approximately 830,000 workers will enter technician jobs after completing formal training programs during the 1963-75 period. Graduates of post-secondary curriculums, technical institutions, junior colleges, etc., are expected to be the largest source of supply, with over one-half of about 435,000 technicians entering from these sources during the period. This, of course, takes into account recent major

increases in funds for technician training. Industry training programs are expected to be the second largest source of supply, with over 230,000 workers entering technician jobs after completing industry programs. Small numbers of technicians are expected to enter from Government training programs, 4-year college and university curriculums, and after separation from the Armed Forces.

It is apparent from the above discussion that the supply of formally trained technicians–830,000–will be inadequate to meet the projected total needs for 1,000,000 workers over the 1963-75 period. Furthermore, large numbers of these new entrants will die, retire, or transfer to other occupations during the period. To meet the need for 1,000,000 technicians, and allowing for attrition of new entrants, about 400,000 workers will have to be upgraded to technician jobs, an average of more than 30,000 a year. Although upgradings of this magnitude would represent about one-third of all new entrants, the picture is not entirely bleak, since this would nonetheless be an improvement over the experience of recent years, when the number of technicians upgraded has averaged about one-half of all entrants. As a result, over the next decade, the proportion of formally trained entrants would show a considerable increase. Nevertheless, it is obvious that if all job openings were to be filled with formally trained personnel, this would necessitate an increase in training activities far beyond that currently planned or anticipated.

There are two other major points of the Bureau's study which warrant mention. One is that graduates of post-secondary programs will be the major source of formally trained technicians over the next decade, and will be the type of technician in greatest demand. However, if the demand for technicians does not reach the projected levels (and the Bureau developed several alternate sets of projections to prove out this point), difficulties might arise in placing some graduates of these programs in desirable positions, particularly in those sections of the nation with large training facilities.

The final point of the Bureau's study that I will discuss relates to the major growth in technician training activities projected for 1975. Federal and state funds for such training have been increased amazingly over the levels of the early 1960's. However, the necessary facilities and instructional staff, and additional finances must be made available for the training of technicians. Otherwise, employers will probably not be able to hire a sufficient number of qualified technicians from formal sources and will be forced to upgrade large numbers of workers, thus lowering the overall quality of the technician workforce. Similarly, if we fail in our efforts to attract students to these technician training programs, the number of graduates of post-secondary technician training programs will be sharply reduced, like wise with harmful effects of the quality of the technician workforce.

In conclusion, I should like to say that the challenge to manpower training and planning officials is clear–to train the technicians our

economy so badly needs. Meeting the technician manpower needs of the next decade will require intensive and continuing efforts in many directions. For counselors and others helping persons choose a field of work, our study also provides a clear picture–that of very bright employment prospects in technician work through the 1970's, especially for individuals who complete a 2-year technical institute type of curriculum.

TECHNICIAN NEEDS IN MICHIGAN

James D. Kelly
Project Director, Technician Needs Study
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INTRODUCTION

The United States economy has moved from an agricultural emphasis, through a manufacturing era and into the present human resources era. Within the shadows of this latest development, a new occupational level is evolving in various types of industry–technicians. The emphasis on the employment of technicians, who normally have post-secondary but sub-baccalaureate education, is recognition of a new occupational level in various types of industry. Technicians, as specialists, satisfy an important segment of manpower in the United States economy. They make significant contributions to research and development teams and they aid engineers in the design and production of various products. In addition, they are found in health-science and many other fields as key assistants to professional personnel.

Initiation and Purposes of the Study

To determine the need for such technicians in Michigan and their training opportunities, the Technician Need Study sought answers to basic questions. This was done through pre-planned and structured interview sessions with leaders in industry and education. There were many questions to which answers were desired. What is a technician? In what industry does he or she work? Where does a technician receive his or her training and is it adequate? How many technicians will be needed in the future?

Initiation and Funding of Project. Dr. John L. Johnson, Director of Administrative Studies, initiated the proposal entitled "The Present and Projected Demand for Technically Trained People in Michigan" and submitted it to the Office of Economic Expansion in the Michigan Department of Commerce and to the Division of Vocational Education in the Michigan Department of Education. It was natural that Ferris State College should ask and seek answers to such questions, because of its history of interest and involvement in technician education in industrial and health occupations.

Purposes of Study. The Technician Need Study was an investigation of the present and future utilization of technicians in Michigan. As stated in the original project proposal, the Study was to be concerned with obtaining answers to certain specific questions: 1) What is the extent of crucial manpower shortages in Michigan by technical area or skill, and the areas of occupation or industry, and to what extent will these

shortages decrease or increase over the next few years in light of current trends? 2) What opportunities for technical training–training beyond the high school level but less than the four year degree level–are available now, and will be needed in the future to assure Michigan industry and business of an adequate supply of trained manpower?

Scope and Methodology for the Study

Counselors, curriculum developers, educational administrators, manpower experts need the general perspective, but to deal with their everyday problems they must have detailed information. For example, there is need for specific information relating both to the supply of and demand for the several types of technicians, and to the educational requirements. Therefore, the concern was not with the broad, general aspects of the problem, but rather with the particular and the specific.

Definition of Technician and Extent of Survey. In the Study, a technician was defined as an employee whose job required basic scientific and mathematical knowledge, or other specialized education or training in some aspect of technology, and who, as a rule, works directly with scientists, engineers, or other professional personnel. The technician is usually employed in job functions that require post-secondary education or its equivalent, but below the baccalaureate level.

In accomplishing its objective, the Technician Need Study undertook to determine the present need for technically trained personnel in Michigan and to project this need relative to real or anticipated technological change so that such employment opportunities that exist, or may exist, can be filled by trained Michigan residents. Industrial growth and increased employment in Michigan will be determined in part by available resources, and qualified technicians in sufficient number are an important resource.

One of two methodologies is generally used in manpower studies. The direct approach is to ask the employer for statistical information. The more indirect approach uses statistical information from census data and employment agencies. There are advantages and disadvantages to each method. Both methodologies have been used to study Michigan manpower. The Technician Need Study used the direct method of obtaining data, whereas the Michigan Manpower Study by Battelle Memorial Institute used census and employment data. Findings of the Michigan Manpower Study are cited, where appropriate, in some of the chapters of the full report on the Technician Need Study.

The Technician Need Study, through interviews and computed estimates included a total of 1,218 firms from private industry with a total employment of 1,140,365. This is approximately 49 percent of Michigan wage and salary workers (excluding government and farm employment) as of January, 1966. In addition, the Study includes estimates for 94 hospitals; but both private and governmental units are included.

It was not possible to draw specific conclusions about the need for technicians in firms employing the remaining 51 percent of Michigan wage and salary workers. These firms are all of a different size, and primarily of a different type than those included in this Study. On the basis of available information, the actual current and projected figures reported in this study represent minimum needs. Actual needs, in most classifications, were no doubt considerably higher.

STUDY FINDINGS

Nothing is static including the demands of the labor market. These demands react to changing conditions and factors. The Technician Need Study itself became a factor in changing the concepts of many employers. In discussions of the needs for, and utilization of, new technicians, interest and awareness of the occupations also were created. As a result, the present and projected needs of firms for technicians increased and expanded during the period the study was in process.

Counselors, educational planners, and manpower analysts may find a summary report helpful in stimulating their interest. The Summary Report will be used in a series of 20 seminars to be conducted throughout Michigan in October and November, 1967. The full report of the Technician Need Study has three broad goals: 1) to illuminate the present situation, 2) to describe anticipated increases in the needs for technicians, and 3) to report on educational programs which are available in Michigan as of the 1966-1967 school year.

There was general agreement among employers that the need for technicians will increase substantially during the next few years. Also, there is a present unmet need for technicians in virtually every classification. The extent of the current shortage, as well as projected need, is presented in detail in the full report. Also, the report sets forth estimates of needs for specific technician classifications and the types of firms (SIC code) in which they are employed. The primary emphasis was on job functions as a basis for the determination of needs by occupational titles.

In general, technicians receive more training in related theory than do craftsmen. However, their training is not as extensive as that of professionals with a baccalaureate or higher degree. Technicians usually become qualified through formal technical training, on-the-job training, or a combination of both.

In some firms it was difficult to identify all technicians. Some employers, by their definitions, classify as technicians only those in salaried positions; they do not include as technicians the hourly-rated employees in the employee bargaining units, even though they perform technician functions. These employers resisted efforts to get an evaluation of positions based solely on job functions and educational requirements. In general, outstanding cooperation was obtained from most employers.

In some firms, more detailed information could have been supplied through visits to plants of the various divisions.

An examination of recent manpower publications reveals an increasing emphasis in the whole area of technician manpower. Employers are becoming increasingly aware of the advantages of employing these trained specialists. If used wisely, the technician can serve to extend dramatically the productivity of the engineer, the scientist, or other professional. The concept of employing professionals and technicians to work as a team provides for maximum utilization of the talents and skills of both groups.

Estimates of Technician Need. The estimated need for technicians in 1970 was obtained by summation of data from two sources. First, employer representatives projected their estimated need for technicians at the time of the interview. The reliability of these estimates vary with a firm's ability and interest in manpower planning; and a number of firms were unable to provide statistics on future need.

Second, the future need of each type of technician for firms not interviewed, but which met the Study criteria, was computed. Firms were grouped by Standard Industrial Classification Code. The total employment of firms not interviewed in each SIC code was divided by the total employment of firms interviewed and meeting the criteria in each SIC code. The resulting rate was applied to present employment of technicians, present technician vacancies, and projected total technician employment for 1970 in firms interviewed, to arrive at an estimate of technician needs in firms not interviewed. The method of computation is described in Appendix A of the Technician Need Study report.

Neither the employer estimates nor the computed estimates included technicians needed for replacement caused by death, retirements, or other attrition. As a result, the future need for technicians, as presented in report tables, is undoubtedly conservative.

Employer estimates on classifications that were not listed in the interview questionnaire were included under the heading "unclassified." Estimates were not made of present and future need for technicians in the "unclassified" category for employers not interviewed; estimates for this group were made only for the classifications listed under occupational title definitions that had been predetermined as significant for inclusion in the Study.

Present Needs and Deficiencies. The majority of presently employed technicians are young-20 to 30 years in age. Generally, they have had some form of post-secondary training prior to, or after employment. The scarcity of trained technicians is a barrier to more extensive use of these specialists. The overwhelming preference of employers is for specialized training prior to employment. Employers would like to see more post-secondary educational institutions develop good two-year occupational programs. However, educational planners often find

it difficult to plan a technical program that successfully avoids the extremes of excessive specialization or ambiguous generalization. The technician needs not only "tool" knowledge but also applicable general education.

Many small and medium-sized firms are unaware of the technician training programs available in post-secondary educational institutions. Furthermore, many employers are unaware of the extent of occupational readiness provided through "hands-on" skill development in the shops and laboratories of these schools and colleges. The emphasis on theory in the classroom, together with simulated or actual experiences, provides those who complete these programs with the qualifications employers want. This type of training program is not generally appropriate for the "less able" student.

Implications for Counselors

In the performance of their information service functions, counselors must keep themselves informed not only on the world of work but also on the training opportunities available. Information on occupational classifications and the required educational preparation are set forth in the 1965 edition of the Dictionary of Occupational Titles, the 1965 edition of the Health Careers Guidebook, and current edition of the Occupational Outlook Handbook. However, such sources must be related to local requirements and employment situations. Industry's requirements for technicians can be met only through the availability of informed and interested young men and women who will take advantage of training opportunities. For example, some employers expressed difficulties in the recruitment and selection of qualified persons for their apprenticeship programs.

Officials in educational institutions expressed a critical need for additional students in some occupational programs desired by employers. Counselors can assist in alleviating such a situation by keeping well informed on the various types, locations, and educational requirements for occupational programs. Counselors should understand that technician training programs are not generally appropriate for the "less able" student. This, plus the fact that most technician training programs require at least average ability along with particular aptitudes and interests, was emphasized by many of the employers interviewed. Not everyone is qualified by temperament and ability to be a technician. All characteristics of the student should be considered.

Counselors should adopt the concept of "occupational readiness" in their contacts and guidance activities with students. It is most unfortunate that the word "vocational" is equated only with educational preparation at the secondary and the post-secondary but sub-baccalaurate level. Instead, the emphasis should be on occupational readiness with the education and training requirements for the level of aspiration for the occupational classification desired. The "incorrect" vocational concept is further perpetrated through emphasis by federal and state

legislation and the designated administrative agencies. Vocations ranging from custodian to lawyer require different degrees of occupational readiness preparation. However, they are both vocations.

High school and post-secondary counselors need to develop a more realistic concept of a "technician." Counselors should be more aware of what technician occupations exist and of the job functions associated with each occupation. The lack of interest some counselors may display for any post-high school education program which is less than a baccalaureate level should be avoided. Industry officials and school administrators should, together, provide opportunities for more contact and exchange of information.

More intensive and extensive channels of communications should be developed between the schools or colleges and the employers of their graduates. The inadequacy of present communications was evident from the employer's lack of awareness of available sources of needed personnel, and from the lack of programs in educational institutions to fulfill essential personnel needs of employers. The communications practices can be of many different types, among which could be:

a. Designated faculty representatives to make continuing contacts on a scheduled basis.

b. The use of counselors and teaching staff members for vacation replacements.

c. An exchange program wherein both the college and employer needs are emphasized in selection criteria and job requirements. This might provide for employer representatives to serve as instructors and for the college faculty members to serve as the replacement during a specified period corresponding to the school terms.

d. Area workshops for management employees and school counselors and faculty members, utilizing employer and college representatives as discussion leaders.

SUMMARY

The findings of the Technician Need Study point toward the continued need for improved counseling services. Counseling on both the high school and college level is difficult because youth and their parents are not aware of the increasing opportunities in the middle manpower fields. More students need to become acquainted with areas of work which are consistent with their individual aptitudes and interests. These individual attributes represent an additional problem confronting the student which is reflected in his or her past record of educational achievement plus aptitudes and abilities for future achievement.

Heavy emphasis has been placed upon the need for improved counsel-

ing services in other studies or reports, whether on national, state, or local level, that deal with education and training needs. Examples are:

> "Rapidly increasing demands for counseling services have led to a great need for additional personnel in counseling profession–demands for professional competence and need for improved and broadened pre-service and in-service training and other measures to strengthen the quality of personnel resources in the profession. The demand for school counselors will be greatly increased in the next few years by rising school enrollments and by the need to lower the student-counselor ratios in many secondary schools and to extend the counseling to lower grades." 1

> "It is of major importance that guidance and counseling personnel familiarize themselves with the story on the skilled worker–especially in terms of this decade's needs for people in this field. It is important for them to know and impart the fact that the crafts represent one of the best job fields for young persons." 2

> "It is obvious that an ideal school program must count heavily upon guidance and counseling, with emphasis on the personal and cultural during the student's early years, and with more and more emphasis on vocational as the student moves into high school and post-high school years. Indeed, the program requires a quantity and quality of counseling scarcely yet attained, and it assumes an availability of information about present and future job openings that does not yet exist." 3

The above quotations leave little doubt on the real need for the role of the counseling and guidance service and the types of emphasis required at various stages of the individuals growth and development. However, it must be emphasized that counseling and guidance services cannot do the total job in the vocational guidance area. Excellent facilities, counseling and encouragement can be provided but these are not enough. There is a need to motivate young people to want to learn–strike the spark of ambition. Classroom teachers can assist with engendering the spark of ambition. Additionally, thought must be given to reaching the parents who will ordinarily stay away from meetings and discussion sessions that would provide motivation and guidance.

Vocational counselors need a phenomenal amount of job information. Trends are important in counseling for the future. However, with only limited time and information, vocational counselors may find themselves in the position of only counseling on jobs immediately available. The expansion and exchange of information under the Vocational Education Act should represent a valuable social investment. The value of the information lies in its availability on a current basis. Improved job information and better informed and mature counselors will be required if occupational trends are to receive adequate attention.

The adjustment process is significant for many individuals in a changing world. Vocational counseling must be available and adequate not only in high school or college but also through other agencies. Such agencies may be governmental, private-nonprofit or for profit enterprises. High school dropouts and even graduates break from the usual school ties and its sources for vocational counseling. The presently existing sources, for individuals that are not enrolled in college, would primarily be the local offices of the State Employment Service. However, this agency is unable to provide complete information on local job opportunities because of insufficient staff or because of the failure of employers to provide information. Time is required for the flow of job information and for matching the location, education, skill, wage, working conditions, and other preferences of job or career seekers with the requirements of employers. Geographic movement is often restrained by lack of information and by the inability of individuals to finance transportation, job search and change of residence. Occupational mobility is often inhibited by the absence of adequate educational background and the inability to acquire needed skills. In the absence of adequate vocational guidance, many young people are not properly prepared for the activities in which employment is expanding most rapidly.

[1]United States Department of Labor, Manpower Report of the President and A Report on Manpower Requirements, Resources, Utilization and Training, Washington, D.C., March, 1965, p. 179.

[2]Wolfbein, Seymour L., The Outlook For the Skilled Worker in the United States: Implications for Guidance and Counseling p. 8. (An address before The American Personnel and Guidance Association, Denver, Colorado, March 28, 1961).

[3]Smith, Harold T., Education and Training for the World of Work: A Vocational Education Program for the State of Michigan. The W.E. Upjohn Institute for Employment Research, Kalamazoo, Michigan, July 1963, p. 42.

Editorial note: Copies of the Summary Report and the full report of the Michigan Technician Needs Study may be obtained from the Office of Administrative Studies, Ferris State College.

WHAT ARE EMPLOYERS SEEKING IN THE TECHNICIAN?

Panel Discussion moderated by James D. Kelly, Ferris State College

Participants (in order of their presentation):

R. J. Collins, Educational Advisor
Personnel and Organization Staff
Ford Motor Company

Roger M. Busfield, Jr.
Associate Director
Michigan Hospital Association

David A. Wills
Salaried Employment
Lear Siegler Instrument Division

Robert A. Large
Placement Director
Ferris State College

DR. MALCOLM SALINGER: We are certainly looking forward with great eagerness to this panel discussion. We have been hearing about the impact of a problem and the seriousness of it, from many viewpoints—from government, education, and results of surveys. In each instance, we must consider the view of the person who is regularly going to be doing the employing. I am not going to take any more time from these people, and now Jim can proceed to make introductions.

MR. JAMES KELLY: This morning, to begin with, I will give you a little idea of how we discussed having our panel function. We plan to have individual presentations, then a short question period. We do want to give you a chance to ask questions about that particular topic at the time the presentation is made. Following the presentations by all panelists, we will then get into, I hope, a good interplay of questions amongst the panelists themselves and between the panelists and the audience.

Just to give you a brief run down on all panelists before interviewing them individually, the first one on the schedule, will be Dick Collins from Ford Motor Company. Through the Technician Needs study, I have a lot of contact with Dick, and I have found him extremely helpful.

Rather than get two industry groups, one following the other, secondly, we will have Roger Busfield who is the Associate Director of the Michigan Hospital Association, then Dave Wills, who is with Lear Siegler; and then we'll get the viewpoint of a placement director from Bob Large who is Director of Placement here at Ferris.

We will start off, then, with Dick Collins, who did a couple of years of his undergraduate work at St. Joseph College, Collegeville, Indiana followed by two years at Loyola.

Dick spent some time in teaching. He was with the Chicago School System for a year and a half. He has been with Ford Motor Company since 1952 in the Chicago area, and in Dearborn at River Rouge. Much of his work has been in industrial relations, salaried personnel and training. I believe it was early this year that he moved up to his present position of educational advisor of the salaried staff on American Road, Ford Motor Company.

With that, Dick, you lead off and then after your presentations, we will have five to ten minutes of questions from the group.

MR. R. J. COLLINS: Thank you, Jim. We think differently about technicians in my Company today than we did 10 to 15 years ago. We have come to realize that some of the work traditionally performed by engineering personnel can be competently handled by technicians. This realization has come about like most discoveries—through necessity.

The growth and expansion of technology has created a steadily increasing demand for engineers. However, it has become increasingly difficult to recruit electrical and mechanical engineers graduating with bachelors' degrees. As a result, we are beginning to rely on technicians for what we anticipated would require the special knowledge of an engineer. But as in many other companies, efficient engineer-technician team relationships are developing. Engineers will be spending more time on system analysis assignments and designing test experiments while technician personnel conduct tests and prepare preliminary reports. It should be a fortunate evolution. Both engineering and technician personnel will realize more fulfillment in their work.

This fortunate experience has caused us to re-examine our recruiting efforts with the result that we are exploring the feasibility of establishing a formal recruiting program for graduates of two-year technical programs. However, I would like to voice our concern for what appears to be an increasing number of two-year "terminal" programs. Technology is growing so rapidly, it is hard to conceive of a "terminal" program. Curricula designed for an occupation should be open-ended. I would like to comment more on this later when discussing apprenticeships.

As an example of the role being filled by technicians, let's look at the computer field. Years ago we assumed that all computer specialists needed to be mathematicians with four or more years of college work. Experience has shown that many computer related tasks can be performed by lesser trained persons, such as, computer operators, peripheral equipment operators, and in some situations, clerks. Operation and preventive maintenance of computer equipment and related clerical work is now being taught by many community colleges.

We still require that computer programmers and systems analysts be college graduates. However, many of these positions are being filled by employees who, after obtaining an associate degree, went on to complete their bachelor degree work at Company expense. This is one of the reasons why we are concerned about the increase in the number of two-year terminal programs. We are continually encouraging employes to continue their education. It is expensive, but it is also one of our best investments. We feel that employes who complete associate, bachelor, and graduate-level work on an after-hours basis are better able to utilize or relate new knowledge to their jobs than new employes who have had little or no industrial experience. For this reason, college cooperative programs are attracting more and more attention in manufacturing and product engineering areas within the Company.

During the past year, we have made arrangements with two community colleges in the Detroit area to establish an associate degree program in industrial supervision. It is too soon to comment on the effectiveness of this program, but it has attracted the attention of a sufficient number of employes and non-Company personnel to justify scheduling the required courses. It might be added that the curriculum has an "open end" design that will provide for the acquisition of academic credit that can be transferred to four-year colleges for bachelor work.

We have also made arrangements with educational institutions to "double track" our mechanical and product design programs so that an employe working toward a bachelor degree can substitute credit courses for certain Company developed courses.

Before concluding, I would like to comment on apprenticeship training. Some may not consider apprenticeship germain to a discussion on technicians. My Company, however, has found apprenticeship training to be an invaluable and indispensable source of skilled manpower. We feel that most graduate apprentices possess skills and knowledge comparable to our better technicians.

As a result of having recently completed one of the most extensive skilled trade task analyses ever undertaken, we will be making several changes in our apprenticeship programs. In addition to changes in shop training, we will be making revisions in the related training curriculum that will result in the transferability of more credits toward an associate degree. We intend to put more emphasis on continuous upgrading of technical competence through continuing education. We feel this can best be accomplished through the design of a related training curriculum that is open-ended and directed toward the re-entry of the apprentice into formal education.

MR. JAMES KELLY: I now feel that it might be well, because of the importance of health sciences and the health occupations, to hear from an individual who is very familiar with their needs. They have been doing many studies on their own at Michigan Hospital Association.

Roger Busfield was Assistant Professor at Michigan State for six years. His educational background: He is a transplanted Texan. Two of his degrees are from the University of Texas, and he has a Ph. D. from Florida State. Of all things, with one of the topics this morning being communications, Roger has his Ph. D. in communications. His work at Michigan State was in dramatics and speech writing. He did some speech writing with Olds and later with Consumers Power Company, and since 1961 he has been with the Michigan Hospital Association.

DR. ROGER M. BUSFIELD, JR: We are watching what is almost a revolution occurring in the health professions and the health industry today. We are watching a shifting of emphasis due to medicare and medicaid. Extensive health planning will plan for everything from air pollution to water pollution, including health facilities, nursing homes, career recruitment, and power training. When implemented in Michigan, it will involve the departments of education, public health, mental health, social services, and will be almost an interdepartmental problem. In the preface to the new public law (P.L. 89-749) that sets forth comprehensive health planning, it announces a new philosophy. It refers to health facilities, health services, hospital services, and patient care as having been a privilege, but now considered by the legislation as an inherent right. It is the first time health care has ever been enunciated in any way as a right with provisions for this right in terms of a comprehensive health plan.

There is an explosion underway, not just imminent. It is underway in every area of the health professions to meet the needs set up by the new Federal legislation in which we are going to have a "cradle-to-grave" Federal role in the providing of health services. We almost have it now in medicare. In medicaid, though it is still tied to need, it comes pretty close to being "cradle-to-grave." I am not in a position to argue the rightness or wrongness of this Federal role. However, I am in a position to report that hospitals are being forced to respond. The services must be provided.

We are watching an explosion of technical needs for the hospital field. It has made us investigate some of our problems because, hand-in-hand with the demand for increased services, is an increasing cry to do something about rising hospital costs. As a matter of fact, President Johnson instructed Secretary Gardner of Health, Education, and Welfare to call a national conference on hospital costs and medical costs. The hospital specialists have always responded to this by saying "Look, there's not much we can do about it. Seventy per cent is an accurate figure for cost payment of salaries and wages, and as long as 70 cents out of every dollar is going for the payment of these services and for these salaries, there is not much we can do." Well, we were skirting

an issue. We had resisted the suggestion that we were inefficient. Well, we started taking a look at ourselves. If we were going to be an industry, we had to act like one. We had to think like one and use some of its techniques. Not too many years ago hospitals started applying management engineering to hospital systems and discovered that although there are still many services that will continue to be person-to-person, to provide the tender, loving, patient-care concept, there were many of the hospital operations that could be, and should be, and are being improved.

We are moving rapidly into the computer phase of hospitals and into the providing of these computer services to the smaller hospital as well as the larger. Hospitals are rapidly moving towards the use of computers, because in the area of information processing, we are discovering we are also able to improve patient care. We are able to pool information. We are able to provide the physician who is taking care of the patient with more rapid information that is going to actually have a direct benefit on this patient's care. Everything from statistics, admission dates, discharge dates, where the beds are, where the specialists are, where the cases are, will be reduced to the computerization process. And we are going to need the technicians to provide it. We are going to be moving full force into computerization. A short phrase that probably sums it up is "Innovations in Health Technology." It will involve various kinds of manpower changes, including changes in job content and the emergence of new jobs as well as some labor savings. Significant changes in technology affecting patient-care facilities are of many different kinds. There are developments in diagnosis and patient care.

We have had traditionally in the diagnosis services the medical technologist, laboratory assistant, histologic technician, electrocardiograph technician, in the area of radiology, the therapeutic technician, X-ray assistant, radiation therapy technologist. They are all in the technician category.

There have to be people to man the various machines that have been developed. It requires trained personnel with specialized training, not necessarily a physician, not necessarily a person with a graduate degree, but a specialist, nonetheless, who can work under the guidance of a physician, for example, to flash freeze a stomach and thaw it out without being detrimental to the patient. The second group relates to hospital information, everything from admitting data to discharge data. These persons are in hospital supply and services. Finally, there is improvement in the management and structural design of health facilities.

We are learning a lot, and we have started taking the long, hard look. We are learning that the traditional way of building a hospital is not the best way to provide the best patient care. There are many innovations taking place in this area, and hospitals have been forced in the past, unfortunately, to provide too many of their own educational facilities, their own educational resources.

Many of you are aware that we have cooperative programs like the training of medical technologists. We do our own training of X-ray technicians, some of this in cooperation with two-year programs. We cooperate in the training of licensed practical nurses. We train nurses, but hospitals would like nothing better than to get completely out of the education business in the formal sense because right now there's no way to pay for it except through the charges to the patient. If we are going to be called on to stop the rising spiral of hospital costs, we have got to amortize our cost of educating these people by passing it on the the patient, and this traditionally is how it has been done. Hospital schools of nursing have been subsidized by the patient revenue. The same is true of the X-ray technician program. It has been partially subsidized.

I was quite interested in Jim's study. It is a tremendous job. I was the one that commented to him this morning that never had I seen so many different agencies assessing the health manpower needs in Michigan; I pointed out that they were finding many similar results, but that still doesn't erase any of the justification for any of the studies, because they have all taken it from different points of view. It is rather interesting to note that the correlation between vacancy and urgency is not identical. Quite frequently, where we have the largest number of unfilled needs, the vacancies, it is not necessarily where we have the most urgent needs to fill those vacancies.

I will give you an example of this. I made a list of the most urgent personnel needs in the nation and in the East North-Central region, which is Indiana, Illinois, Michigan and Wisconsin. You might be interested in knowing that just in Michigan, alone, we could employ today, not ten years from now, 13,125 additional personnel, professional and technical, in the technical areas. In the United States it is estimated that the current personnel needs are over 116,000 and that 84 per cent of this represents the five most urgent needs nationally, which are: the registered nurses; aides, orderlies, and attendants; licensed practical nurses; then come medical technologists, and dietitians. That is the national picture in rank and order.

In the East North-Central region–Indiana, Illinois, Wisconsin, and Michigan area–nurses are and still remain the number one need. Nurses' aides, orderlies, and attendants remain second; licensed practical nurses, third; medical technologists, fourth. But we have plenty of dietitians. Our need is for physical therapists, and this perhaps has been brought on because Michigan is and has been one of the pioneers in terms of geriatric services and rehabilitative services. We have a strong need for physical therapists and physical therapist technicians and aides in Michigan right now, today. This is not a project for tomorrow or five years from now. We could hire, urgently, about 3200 technicians. That is, we could fill and put into paying positions thus far; and this again is nurses, number one. We still have needs that are not being met. Of registered nurses, 1681, and this is about 53 per cent of our needs. Right now, we are operating the hospitals without them. We are using licensed practical nurses. We would like to use less of them. If we used any less than we now use, we

couldn't operate our hospitals at all. They are technicians, the ones that are most in amount. Aides, orderlies and attendants are number three. Medical technologist have followed the national pattern, and physical therapists are our fifth strongest need in Michigan.

We are aware that we should think in terms of unit management, and we are looking for unit managers, and this unit management concept in hospitals has probably been in operation for about five years now. It started off being aimed at the college graduate. Presbyterian College in Chicago was one of the pioneers in the area. They lost their original group six months later because they were not looking for people with a great deal of ambition, and they had to find people who were satisfied to remain as unit managers, even though we can say you could probably make eventually $8500 to $10,000 in unit management. We seem to be revising our ideas, because college graduates are mostly interested in using this as a brief resting place on the way to a more secure position.

Michigan State University has come up with their middle-management program. We have a contract with Purdue University. We will enroll the employees that we have, whether they are ward clerks or good orderlies, who we think have the potential.

We do have an acute need in Michigan in the area of health technology. That need is not being met at the present time. We need many more programs in the future. We need baccalaureate programs and we need a wider understanding of the technicians. I argue with Jim describing this as the under-baccalaureate degree, because you produce what we consider one of our prime technicians. Now he probably resents being termed this–I mean your pharmacist–but he is basically a technician, and he is desperately needed in our hospitals today. We are trying to direct them towards hospital pharmacy. We can pay a pharmacist the same pay as running a drugstore, but he still wants to be his own boss. Because I am a conservative, I prefer that he has that view, but it doesn't solve our problem. You see, it is very difficult to be an active health professional, too. I find it very difficult on one hand, to put out my hand for the Federal grant and the other hand spending it.

MR. KELLY: Next, we will hear from Dave Wills who has his B.A. in psychology with an education minor from Western Michigan University and he has done graduate work at Ohio University and Michigan State. Dave's work experience: for one and a half years he did vocational counseling at M.E.S.C., involved in Job Corps, I believe. I think–my original discussion with Dave was a year ago in March. He related some very interesting experiences, and I hope he relates some of this to you, along with some of the Lear Siegler Instrument Division viewpoint, where Dave has now been for the last 18 months, primarily in employment interviews and recruiting.

MR. WILLS: Thank you very much. Briefly what I would like to cover are some details on the aerospace industry. In general, the aerospace field covers all areas of science, including even psychology. Now, this success in space flights has captured the public image and focused the limelight on our industry. The growth of our field is fantastic. In 1961, when Shepherd went up into space as the first U.S. astronant, there were already, 1,117,000 people employed in the aerospace field. One man, or a small handful, got all the credit for it, but the field had already arrived by this time. Over one-fifth of our country's scientists and engineers are involved in aerospace in some capacity. Although aerospace industries manufacture some commercial products, 85 per cent of our sales are related to the government. Trends that make us a little bit different from some other industries, such as the automotive field would be the tremendous amounts of change, as science comes up with new ideas and we implement them. Because of the interest in space now, the advancement is rapidly accelerating. Really, we came into being during and after World War 11. Before that, there just wasn't anything. We are going to discuss technicians, and our need for this type of individual. He didn't exist, to speak of, in industry before World War 11, and all at once, we need literally thousands of them.

Getting back to one unusual characteristic we have in our industry, we often outstrip our own people. Some of our top engineers and designers from World War 11 or even the early 50's are finding they are jobless today with the tremendous need you hear for a B.S.E.E. degree. There is a fellow in Grand Rapids who is selling used cars; he can't get a job in our industry. He was very active in World War 11, he was a designer; he could show you some of the planes he laid out. He was working in electrical equipment. He got out of the field in 1952, I believe it was. He went into private construction with the money he had made, but unfortunately, he didn't hold to it very long, and about five years later he was broke. He couldn't get back into our industry; nobody needed or wanted his skills. Consequently, the pressure is on the scientists, the engineers, and now the technicians, to continue their education even while they are employed. If they don't, they just get left back. There isn't that much room to put them in an administrative function.

What are we getting to? Our company makes navigational and guidance equipment for aircraft, spacecraft, and missiles. We employ out of that 1,117,000 people, about 4,000. Around 45 per cent of our own people are

white-collar people, skilled people, engineers, and scientists. These, plus many of our clerks and blue-collar people require in their present jobs, and have, more than a high school education.

In our firm we have about 350 engineers and scientists who are primarily engineers. We are actively recruiting for 50 more. That is quite a percentage increase. Obviously, this demand for scientifically oriented and trained professionals far exceeds the current supplies.

In refering to some figures circulated this last year, I think there were about 22,000 engineering graduates in this country and better than 122,000 job openings. These kids in engineering were walking into something that was just great with competitive bidding on wages. However, the only current solution we have, other than robbing each other of skilled employees–which we end up doing finally–is to make better use of the engineers we have, and better use of their time. This means, basically, we are going to have to eliminate job duties that lesser trained people can do and the engineers are currently doing. We can do this by training our own people for other tasks, to take on more responsibility, but in order to train these people ourselves, they have to have a certain educational base and level. This, most of them do not have.

This is why we are turning to Ferris, to engineering schools and to the technical academic schools that are cropping up all over. They realize the tremendous need we have currently. There are in the aerospace field, about two technicians to every three engineers. The only reason for this ratio is we can't get any more technicians. By 1970, we would like the ratio to be one engineer to one technician, if possible. You folks, as high school counselors, have to get and keep those people in technical school for us. Please do so, we need them. It will take two years of training. By 1980, we would like that ratio to be two technicians for each engineer.

The engineering schools cannot supply us fast enough with engineers. We have to do something else, and this is why we are looking to the technician. The definition I would use for technician, and it seems to be pretty vague (everybody has their own definitions) would be that his job is to take an engineer's idea and put it into concrete form.

I have given out some job descriptions of representative technicians that we have. You can take a look at what at least we would like from these persons when we hire them–believe me, we don't get it very often–but that is what we are listing for their minimum qualifications.

Offhand, we have seven different technician scales that I use. Primarily, these are set up for wage and salary administration purposes. Within each one of these divisions we have a wide variety of actual skills. I have five openings right now in one of the labs. We wouldn't hire five people who are the same. For one of these men we want electro-magnetics background; for another of the men we want experience in working with solid state circuits. They will take the equipment and put engineers ideas

into the physical reality.

Basically, our technicians must know one heck of a lot about equipment, fancy test equipment. They have to know how to repair it, and how to use it, and this takes quite a bit of training. As far as a technician trainee–this is obviously most of what we hire–(experienced technicians we can only steal, and we get them stolen from us, so that works out about fifty-fifty) he would need two years of college training in electronics, hopefully a little bit of experience, but not essential, and this fellow would start with us at about $6,000 a year. He is rare. He can advance steadily, and with experience, to somewhere between $10,000 and $12,000 in five to seven years. The difference would depend primarily upon his overtime, and there will be a lot of it.

The greatest source I have found, though, in recruiting technicians is not schools; it is the United States Armed Services. These are the folks that are training most for us, although from a training standpoint, the school is better than the armed services. The armed services is training them as fast as they can, and putting them on the job. It is mainly factual knowledge, and the school has the time to give them a wider overall knowledge. But we have to get somebody, and while we are waiting for those kids to get out of school, we take the Armed Services men.

In Grand Rapids, we find you can take an armed services man, and he will go back to school on his own. We pay for part of his tuition, and he will pick up what he doesn't have, and it has worked out pretty successfully.

In trying to characterize what a technician is, and maybe this would help you in dealing with students, we find he is a fellow with very strong mechanical aptitude. Whatever that is, he has it. He likes to get his hands dirty, but he is also average, at least, generally above average in terms of overall intelligence. He has an interest in the physical sciences–this would be higher level math, chemistry, physics, hopefully even calculus. This type of a fellow at the same time, must be able, as Dick said, to communicate.

He will have to write reports. As he gains knowledge and skill and background, he will work very closely with professional engineers. He will be expected to give his ideas on what happened in the experiment or on the test equipment–he may have been doing it for years by then–and he can come up with what probably went wrong. Consequently, he is right in there on the bull sessions with everybody.

Going back to what we find a little ironic is our experience with some of these kids coming out of the Air Force. Many of them have a high school record that is actually terrible. D's in shop class, they couldn't even pass wood shop. They couldn't have cared less. They may have a little trouble spelling their name on the application, but some of them did get into the Air Force, and when they got in, there

they took an aptitude test–and as soon as they were given training they performed outstandingly. (We get them, and we find young men who, at this point, kind of realize what they missed in high school, what they have to have to improve a little more, and they will be back in our junior college night programs.)

As Dick has suggested, we should have chances to go out and talk to students. Again, as an employer sitting there in a personnel office, you find kids listen to what you say. It is the same thing you folks as counselors, as teachers, have been telling him, but all at once the word of God hits him right between the eyes. Some stranger, some employer, some fellow sits there and says the same thing, and he walks out of there just amazed. He never thought of it that way before.

We are willing to do this. It is great. Send the kids out or get us invited. On an individual basis, these kids will profit far more if you have the time to get to them. Try to stress this individual need. If you can do that, almost any employer, admittedly on a limited basis, will sit down for a few minutes with a kid even though he is not ready to go to work yet, and talk to him about jobs. The employer himself always has up-to-date occupational information on jobs that are right out there waiting. This way you can avoid trying to know every single job in the city and about every change in the country.

If you will prepare the student to ask the questions so he will know where generally he might like to look then you sort out the industries and make three for four appointments with him–get him out of the schoolroom–get him into the employer's office and let the employer talk to him a little bit. We will show him around a little bit; both in groups and individually this can be done.

Have any of you ever tried this? Have any employers ever turned you down and were too busy? We can give them the information that is accurate and factual. And that, in essence, is about all I want to say.

MR. JAMES KELLY: The final panelist we have is Bob Large, Director of Placement at Ferris, who deals with many employers recruiting technicians.

Bob has just finished his first year at Ferris. Prior to that he spent six years in Fort Wayne, Indiana, at the Indiana Institute of Technology. He has a B.S. from Wayne State, an M.B.A. from Indiana University, and has done personnel consulting.

With that, Bob, we will let you get into giving us the point of view of placement director.

MR. ROBERT LARGE: Thank you, Jim.

I want to limit this presentation to three broad areas: First, a little bit about placement operations at Ferris; second, the employer's needs; and third, some changing patterns and trends in the selection and hiring of technicians.

Jim made mention in his report of the inadequacies of some of the placement offices in the community and junior colleges. Consequently, I feel some comment should be made about the Ferris placement operation which, in contrast, does seem to be fairly well organized to serve both the student and the employer in terms of their needs and expectations.

Several of you suggested to me in the last several days that being a placement director must be relatively easy in these prosperous times. You know, there is really no problem in "placing" technicians or other college graduates, if the goal of the placement office is only to place people in a job. But that is not our only goal. Here are some of our primary objectives: to promote a career choice on the part of the student for optimum benefit to himself, to his employer, and to society; secondly, to instill within him a sense of responsibility toward his profession or his occupation; thirdly, to bring together those employers and students who have mutual interests.

One of the programs that we have at Ferris to implement these goals is the campus recruiting program. Last year we had approximately 175 different companies send representatives to campus to interview students in our two-year programs. Some of these employers made only one trip, some made as many as four. The employers ranged from small, one-plant operations with perhaps only fifty to one hundred employees to the very large multi-plant, nationally known corporations such as Ford and Lear Siegler.

We will see some significant growth in terms of employer campus recruiting activity over the next several years as the need for technicians increases, and I think much of this growth will be represented by firms from outside the state. We have a fairly good coverage in Michigan already, but judging from the activities last year and some of the correspondence I received so far this year, we will find a number of out

of state corporations contacting us at Ferris to help them fill their technical manpower requirements.

I went back to the office after lunch and found the following letter in the mail from a large computer manufacturer:

> "We need your help. We must find technically trained personnel to meet the rapidly growing demand within our company. We think your school can help us find these people trained in electronics, computers, maintenance programming, and electrical and mechanical drafting, for positions as customer engineers, test development technicians, and application aids programmers, training programmers and draftsmen."

This is a very typical letter, and we will receive many more. That is the picture of the placement operation at Ferris.

I might also add that we work very closely with the faculty members in the various departments. A placement operation cannot be successful unless it has a strong support from the faculty, and we have moved in that direction.

What are the needs of employers? What are employers looking for in a technician? First of all, (and again this is perhaps beating a horse to death) much concern is shown by employers in regard to communication ability of students. This is the area where candidates seem least prepared. And this is not just true of Ferris graduates; it is true of many graduates, and not necessarily the two-year graduates; it is true of four-year graduates as well. There is a tremendous emphasis on effective communication in industry, and particularly on ability to write reports. Now I hear this time and time again from all types of employers, large as well as the very small.

Many of the larger employers are looking at the two-year technical graduate as a potential first-line supervisor.....a man who can step in and fill the gap that Dick and other panelists have mentioned. They feel that the individual who is graduated from a two-year program has enough technical and liberal arts courses to perform very adequately as a supervisor. With a background that has some generalization as well as specialization, he has every opportunity to move up through manufacturing management.

What are some of the trends in the employment and the hiring of the two-year graduate? With the increasing need for the technician candidate, industry will have to do a much better job of projecting their needs, and this was clearly brought out in the report. I think most all of the firms that Jim and his staff interviewed indicated the strong need for technical manpower to fill the gap. Yet very few of them had done much in terms of manpower projection, technician need studies, or manpower evaluation in general. They realize the need for technicians,

yet have done very little in terms of analysis and study. But this will change.

I think we will see firms develop a more organized campus recruiting and college-relations program for the two-year graduate. The summer training program and the co-op program have been mentioned. These will receive greater emphasis. You have seen a similar trend for the engineering student as the market got tighter and tighter. Now employers are bringing in the technician candidate before his graduation, providing an opportunity to become acquainted with the industry, and hopefully selling him on the firm. The student in the two-year technical programs will find some of the better jobs during the summer, and some fine co-op possibilities. Let's face it, the engineer and the science major are getting the cream in the summer jobs in terms of employment related to major fields of study, and this will occur for the technician as well.

Finally, colleges will become better prepared in terms of placement operations to serve the student and the employer, and do a better job of serving as a medium of communication between industry and the student.

Now, one more point, I don't know to what extent it has been mentioned, but I feel it needs emphasizing, and that is the employment of women.... particularly the employment of women in technician jobs that have been traditionally filled by men. There have been some significant gains since President Kennedy's Commission on the Status of Women in 1961. We have seen the Civil Rights Act of 1964 which prohibited discrimination in several areas, not just the race and nationality, but also in sex. The Equal Pay Act of 1963 was a wage protection piece of legislation for women. And then the Economic Opportunity Act stated its purpose was to develop the potential of all disadvantaged people. Vice-President Humphrey referred to the women as the underprivileged majority. I think this is significant. Perhaps the most underutilized talent in this country are our women. There has been a changing social climate in industry as a result of this legislation. I think our employer representatives here will agree that the doors are opening to women in many areas where they previously had been closed.

Now, what can the counselor do about this? If a girl comes in and says she wants to be a draftsman, and she has the ability and the motivation and the interest, steer her toward a good drafting program. What is wrong with having a chief draftsman with lace undergarments, (unless maybe the draftsman's name is George)? Talk to the girls in terms of a total-life plan, lifelong careers, not just the initial job after high school or after they finish a two-year program in college. The cycle is going from job to marriage to child rearing, back to the labor market. In the age group 20 to 24, 52% of the women are employed; in the age group from 45 to 54, also roughly 52% of women are employed. We have this split-level characteristic in the working life of women. I think we should mention career choices to the girls in terms of this

total cycle. We must help them realize their full potential for the remainder of their lives.

That pretty well sums up what I had in mind, Jim.

MR. KELLY: Thank you, Bob.

I am particularly pleased that you brought the women in on it, and you used an excellent example because the engineering companies did mention frequently in our study that they were employing more and more women in the drafting department on the drafting board, and finding them very effective, very satisfactory.

DEVELOPMENTS IN VOCATIONAL-TECHNICAL EDUCATION IN MICHIGAN

Ralph C. Wenrich
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While I was preparing some notes for this occasion, I tried to think of why I should be invited to talk to you this afternoon about developments in vocational and technical education in Michigan, and then my thoughts ran back to an article I wrote which was published in the Michigan Journal of Secondary Education in the spring of 1962. I thought maybe there was some connection with this article because the title of it was, "Employment-bound Youth Need Guidance Too."

The thesis of this article was that the lion's share of guidance services in our high schools are going to the college-bound youngster and that the employment-bound youth in our high schools are not really getting their fair share of attention from counselors in our high schools, and then I went on to document this. I was particularly critical in this article about their failure to do what I think needs to be done.

Employment-bound youth, I suppose, were getting (and the evidence seemed to show that they were getting) about as much counseling services as college-bound youth, but they were certainly not getting a fair shake when you considered the placement services and the follow-up service of the guidance programs in our high schools. We were giving much, much more attention at that time (1961-62 when that article was written) to the placement and follow-up of college-bound youngsters than we were to employment-bound youth.

I am not sure that that situation has changed significantly between then and now, although I like to think that it has. Well, after that article appeared, I got quite a few invitations from counseling groups around the state of Michigan. I suppose they wanted to take me to task and in some places they did for my rather sharp criticism of the situation as I perceived it at that time. I was really glad to have these contacts with counseling groups. I spoke to quite a number of them and spoke to quite a few workshops dealing with counseling and guidance, and we had an opportunity to get to know each other a little better. I found some of my criticisms should not have been launched against counselors; I should have been attacking the educational enterprise and the education structure more than counselors. As a result of this encounter and this experience with guidance people, I have changed some of my ideas about their responsibility and about their roles.

I am sure it is no news to you, and especially since I look at your program and see some of the experiences you have had in this workshop; it is no news to you that the guidance movement started as vocational

guidance and that vocational education really was responsible for some of the early developments in the guidance movement. I am sure that Ken Hoyt brought this message to you and made this point in one of your very early sessions.

But then, something happened and the guidance people seemed to abandon their parent, if you want to call it that, and this I guess is understandable too because vocational education has had such a poor image for such a long time I can't blame guidance people and counselors for not wanting to be closely identified with it. In fact, few people throughout the past several decades have cared to be very closely identified with vocational education. But this has changed during recent years and I want to talk about this change.

What I am saying is that we can't blame guidance workers too much for not being as enthusiastic about helping kids to make career plans and about providing career guidance, which is distinguished from more general types of guidance or academic guidance–guiding people into careers that require something less than a college education, as opposed to guiding them into colleges where they might prepare for one of the professions. I guess we can't really blame the guidance people too much for this because, not only has the image of vocational education been less than good, but also the vocational educational offerings in our high schools have been so limited and some of them so dysfunctional that there was really little point in helping youth make career choices when they could not get preparation in our high schools which would help them achieve their career goals. But this, too, has changed and is changing. Now, I could talk about the developments in vocational technical education in Michigan, but this sort of puts it in the past tense. I really think that vocational and technical education in Michigan is developing and it is developing at a rapid rate. Therefore, I would like to talk about the development of vocational technical education in terms of a little bit of the past, a little bit of the present, and perhaps more of what we can do about the future. This will be my approach to the topic given me.

The development of vocational and technical education in Michigan in the past has been inhibited, retarded, has not developed as fully and as fast as it should have, probably for two principal reasons. One reason has been that the education enterprise, I guess that's Conant's term,–but I'm talking about the education system in which we are operating in Michigan–has been controlled by those who are basically academically oriented. The emphasis has been on college preparation and general education. Vocational education came into this system, or into this enterprise, as an uninvited guest. And public education (the system, that is) has not been a good host. Now we can elaborate on this if you like, but this is the heart of the point I want to make. This is not only true in Michigan, incidentally, and much of what I am going to say here about the developments of technical education applies across the country, or in most states nearly as well as it applies to Michigan. The educational enterprise was tooled up to the task of preparing youth for college.

The early American high school, like the Latin grammar school, and the early American academy, (these predecessors of the high school as we know it today) were predominately college-preparatory institutions. Faculties and administrations of these institutions were oriented toward the task of preparing youth for college. The additional task of preparing some youth to go directly from elementary schools and high schools into employment was more or less forced upon "the educational enterprise" through the passage of the Smith-Hughes Act in 1917 and subsequent federal subventions and encouragements of one kind or another. Hence, the educational enterprise did really not welcome vocational education with open arms. In fact, it resisted this newcomer to the educational system, and vocational education has had an uphill battle in terms of making its place–carving out its place in this modern educational system.

Now, I might just give you one illustration of how some others outside of education perceived this problem. When Michigan got a new constitution and when the constitution mandated that the one hundred-nineteen or twenty departments and committees and commissions of the state government be regrouped into no more than twenty departments, people in various governmental agencies in the state of Michigan started looking around to see how we could reform and regroup state governmental functions so as to put them into no more than twenty departments and where we could have compatible services in each of these groups or departments. At this time there were quite a few people outside of education who tried to move vocational educators into some other department than the Department of Education. They said in effect, "Look, education in Michigan has not really been a very congenial host to vocational education. You have not had very much support from the educational enterprise. Why don't you join us? Why don't you vocational educators come over and join us? We will support you. We will give you the kind of resources you need to do the job adequately."

This is not my own notion that education has not always been a good host to vocational education. There are others who viewed this problem similarly. But I don't want to dwell on that. I will be glad to come back to this subject later during discussion period, or tomorrow. I will be very happy to discuss it with you in detail.

The second reason why I think vocational education in Michigan has not been properly nurtured is that preparation for employment was recognized in our statements of educational policy and educational philosophy, but our practices have lagged far, far behind. Practically any national policy statement includes the function of preparing youth to make the transition from school to employment. In our formal statements of policy and philosophy this function is clearly recognized, but for some reason our practice has lagged. One of these reasons might be just social lag. We hear people talk about how long it takes before education catches up with social and economic changes, conditions, needs. Some people say it takes fifteen years; some say it takes twenty; some say even more than that. I guess it takes a certain number of years for public education to catch up with changes in social conditions and social needs.

Another reason for the discrepancy between policy statements and actual practice might be related to the fact that our organization and administration has been based upon the original purposes of public education. In speaking about the high schools the original purposes were to prepare youth for college. The administrative structure of public education was designed to facilitate that single objective of secondary education, and it was not designed to achieve the purposes of the so-called comprehensive high school. For example, let's take the typical high school administrative structure. What does it look like? It is made up of academic departments–math, science, English, social studies–what we formerly used to think of as the college transfer subject matter fields, to which we have added industrial education, business, and maybe home economics, and in rural school districts, agriculture. However, the basic structure to which we have added these appendages was a structure based upon departments designed around academic subject matter fields and academic disciplines. This is still the basic structure in the average high school in Michigan (and in the average high school in the United States).

While on this subject of organization and administrative structure, one might say that another reason why we have not been very successful in the development of vocational technical education until recently is that our administrative units were too small. We could not hope to do the job that was expected of the comprehensive high school in schools as small as many of them have been and still are. I don't know how large a school must be in order to be comprehensive. You can take Conant's definition, but I think he has revised his estimate of how large a comprehensive high school should be since he has written his book, The American High School Today. In that report he said that a high school to be comprehensive would need at least a hundred graduates each year–that would make it a school of four or five hundred students. Today, I think Conant would say a comprehensive high school should have at least a thousand students. I think a school of a thousand is probably necessary to provide a truly comprehensive program, and even then I don't think it can be a comprehensive as many of us would like to see it. Incidentally, consolidation of school districts has not resulted in larger high schools. We have not consolidated high schools. We have move from six thousand school districts in Michigan down to about eight hundred school districts, but we have not eliminated high schools. We have more high schools today than when we had six thousand school districts. Now, these high schools have grown somewhat larger simply because of the population explosion, but we have not combined two small high schools to make a large one in many situations. You may be able to see two or three situations around the state of Michigan where this has happened.

Another matter relating to organization, and I think it has impeded the development in Michigan, is the controversy between those who believe that we should develop comprehensive high schools (and that vocational and technical education should be a part of a comprehensive high school development) and those who would like to set up specialized trade schools and technical institutes.

I suppose another reason why development has been retarded is the expense involved. There isn't any question about it, vocational and technical programs are more expensive than college transfer programs and academic programs. That, I think, is probably self evident.

Another reason perhaps is that vocational and technical education in the past was needed by a relatively small proportion of the total labor force. The professionals needed it, to be sure. They went off to our colleges and universities and got their vocational training in medical schools, dental schools, engineering schools of education and so on.

Some of my colleagues on campus are shocked a little bit when I speak of the University of Michigan as being a great big vocational school; but what else is it? That is what kids go to the University of Michigan for, to prepare for a vocation. On that level we call it a profession, but what is the difference between a vocation and a profession excepting, perhaps, the amount of education involved and the fact that usually with professions we associate baccalaureate and advanced degrees?

What I am saying is that, until relatively recently, only a small proportion of the total labor force actually needed a considerable amount of education–professional education. Vocational industrial education, at that time was education for the skilled trades designed to prepare persons to function in highly skilled occupations in the labor force. Many people in the labor force simply found their initial employment, learned on the job, grew and developed on the job, and became successful workers through their experiences on the job. But opportunities for this type of learning and this kind of help in making the transition from education to work are disappearing rapidly. I was intrigued some time ago by an article in the Detroit Free Press by Judd Arnett in his column, titled, "What Should We Teach." He said,

> "When I was in high school more than thirty years ago, two standard courses were offered: the college preparatory and the general, with the latter involving the studies required by the state plus some 'commercial' and some 'shop'. In general a youngster did not learn enough in any one shop to qualify him for a job, but employment standards were lower, so you could find a place in industry if you wore out enough shoe leather looking for it. Today the demands of industry have changed."

This is still Arnett speaking:

> "The schools are teaching pretty much the same subjects, the emphasis remaining on the college preparatory despite the fact that a very high percentage of our young people lack either the desire, talent, or the money to pursue the academic life. Something must be done to arouse the interest and uncover the latent ability of the young people who do not aim for the professions.

It would seem that what we need is a great deal more vocational training for those who will be lost without it."

So, we have this condition and you have undoubtedly taken a look at our technology and our changes in our society and you are aware of the facts and conditions that have created this situation where today a much larger percentage of our labor force needs some type of formal education in order to help them make the transition from school to job.

I just came from the central administration building where I saw a book case display announcing the high school preparation program here at Ferris, and I noticed one of the social studies books. The title was, The New Social Order. We are in a new social order; we are in a different situation today both technologically and sociologically.

The last point that I want to make here is that the lay control of public education, primarily school boards, but not limited entirely to school boards, has not been really representative of great masses of the people. Now, if you want some documentation for that, there have been plenty of studies of school board membership. We know that school boards have been made up predominantly of professional people, and business men in the community. Primarily, these are people whose sons and daughters are very likely to go to college, and so the high schools (as far as their children are concerned) have served society quite well. But, these people are not representative of the total population of our society and, therefore, should not be expected to speak for all elements of society. This, too, is changing.

Technology has put education squarely between man and his work. As I said before, education has always stood between some men and some kinds of work, the professions notably. One could not get into the professions without going through an educational program preparing him or her for the profession of his choice. But today, this condition exists for most men and for most work. Now, this is not my idea, it is not original. If you haven't been introduced to Grant Venn's book, Man, Education and Work, where Grant Venn discusses this concept in the first chapter in this book in great detail, I would strongly recommend it to you. He has called our attention to the fact that modern technical developments had put such demands, educational and training demands, on workers that education now stands between man and his work, for most occupations, not just the professions, not just the technicians, the highly skilled trained men, but for the labor force in general.

The social conditions of today demand that the time-worn phrase "equal educational opportunity" be given more than lip service. Equal educational opportunity has never meant that all boys and girls should have the opportunity for the same kind of an education. Equal educational opportunity has always implied diversity, and we have not always provided in our schools this kind of diversity of educational opportunity, so that the varied interests and needs of boys and girls could be met.

These conditions, social and technological, have created a climate in which vocational education is getting more support than it has ever had. One of my colleagues on campus in Ann Arbor says, "You fellows in vocational education have never had it so good." I think this is right. There has never been so much popular support for the things we are trying to do. With so much support, we are somewhat overwhelmed.

Perhaps people are expecting much too much from vocational education, and this is what worries me. It is absolutely essential, therefore, that we bring these expectations in line with reality, with something that might be feasible and possible for us to achieve.

Well, now that we have this favorable climate in which vocational and technical education is supported by both the general public and the education enterprises, what must we do?

First of all, I think we must make all education, including vocational and technical education, student oriented rather than subject matter oriented. Counselors are in a key position to do something about this because you are basically pupil oriented, individual oriented, student oriented. All too much of our education is still conceived in terms of traditional subject matter patterns and disciplines, including some of the vocational subjects, if you please. We are teaching wood working, we are teaching machine shop, we are teaching English, or science; we are teaching subjects. The time has come when we have to start looking more seriously at the needs of boys and girls, and we have to orient our educational programs toward youth, toward the student.

Second, I think we must understand what is education for work, education which is relevant and functional. From some of the comments I have already heard from some of you, until the experience in this workshop, you didn't really understand what vocational education is. There are still many school administrators and teachers who think that anything that goes on in the shop is vocational education. They don't realize the difference between industrial arts and vocational education. Now that you know the difference, you have to help educate the rest of your colleagues and perhaps your principal and your superintendent, on the difference between practical arts and vocational education.

Third, we must involve the whole faculty in the process of educating youth for work. It is not just the task for a few so-called vocational, industrial, business, home economics or agriculture teachers.

Incidentally, there is no special body of subject matter which is vocational and another which is general. Any subject matter that you want to name can be vocational, depending on how you teach it and the purpose for which you teach it. We must examine all subjects in the school curriculum to see what contributions each can make to the education of boys and girls for the world of work.

Another point is that we must provide vocational education for

all youth. I resist the division that we make between employment-bound youth and college-bound youth. All youth are employment-bound, even those who go to college. We can help them with the skills and competencies they need to make themselves employable, whether they are going directly into employment from high school, or into college for a year or two or four before they are engaged in full-time employment.

Next, we must recognize competencies in vocational and technical teachers, other than those reflected in college credit and degrees, and we must reward them for these competencies. If we can't get a person with a bachelor's degree, who is occupationally proficient perhaps we can find one without the degree who has the skills and abilities that we need. It seems to me this type of person has to be employed, rather than the one who has the greater number of college credits.

Further, we must greatly expand and improve guidance services. Our placement services for employment-bound youth are not very good in most schools, and I don't think you can say that this is the job of the Michigan Employment Security Commission. This is your responsibility, and if the schools fail to perform the function of placing their product in jobs, they are denying themselves the kind of feedback essential to keeping a program vital, and functional. It is this way that we are getting our feedback from the employers; it is this way that we find out what employers really think about our product. We do it with the kids we send off to college; your principal comes to our campus every fall and interviews the students who are freshmen on our campus, and he does the same thing at other campuses. Why don't we do something of this sort with the kids who go directly from high school to the job? It is harder to do, but this is no excuse for not doing it.

COMMUNITY ACTION PLANS IN WHICH COUNSELORS CAN BE INSTRUMENTAL

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In consideration of the objectives of the conference, we need to examine the status of guidance in vocational education, and to identify the problem areas. The matter of the status of vocational education, and guidance in vocational education brought to public attention by President Kennedy's education message in 1961 was examined by a panel of consultants. The panel, as you know, produced the report, "Education in a Changing World of Work." Recommendations which came out of that report led to the enactment of the Vocational Education Act of 1963 and set the stage for many changes now taking place in vocational education. Guidance is an area where radical changes are now in evidence.

The problems facing us are those which only educators can solve. The late Adlai Stevenson said, "It is the educator, not the engineer, not the businessman, not the union official, not the bureaucrat, who must tell us how to keep our youngsters in school and prepare them for productive lives." In the resolution of some of the major problems which face us as they relate to automation and technology, it would appear that vocational education guidance personnel must do three things:

1. Establish a basic approach for educators to acquaint them fully with the nature and implications of the problems created by automation. Much more study is required before we know what the full empact of automation will be. This will require the cooperative efforts of economists, our social scientists, and our business researchers. In the meantime, we must acquaint people with what we are aware of. There can be little hope for smooth social adjustment to great economic change unless the general public and the work-a-day world is well informed about the nature of the situation which exists.

2. The second thing which education can do is to readjust its approach to vocational-technical education. There is little purpose in preparing people for jobs which no longer exist because of technological change. Jobs which require little skill, or which are physically or mentally repetitive in nature, will all but disappear. While many people are without employment, a considerable number of jobs requiring a high level of skill and specialized training remain unfilled. We must speed up the change in our occupational oriented programs in order to correct this imbalance and we must upgrade vocational-technical skills in the entire spectrum of the occupational world.

3. Our vocational education system must prepare people to live in a world in which work will not hold the central position it has held in the past. It will be off to one side, contributing to society, but not dominating it. Concern will have to shift more to the development of people as human beings and less to preparing them to become cogs in an economic machine. This, of course, is a projection for the future--we have had little experience with freedom from toil in an economy of abundance, but the time is almost upon us when we must prepare people for a wise use of a great deal of leisure time and work time.

The study conducted by the national committee for the appraisal and development of the junior college student personnel program under the direction of Max R. Raines, provided an excellent appraisal of the current procedures of guidance in two-year institutions. Mr. Raines lists twenty-one basic functions as to personnel. He found twenty-five percent of the larger junior colleges doing satisfactory, and seventy-five percent of the junior colleges studies have inadequate student personnel programs.

The report identified other deficiencies, such as: lack of evaluation, inadequate staffing, no formalized programs for upgrading of counselors and guidance services, and a lack of professional qualified personnel and the absence of resources to develop community guidance centers in community colleges and in secondary schools. The preparation of active personnel in the guidance field is deficient both qualitatively and quantitatively. It is important that this shortage be alleviated by supplying persons with an understanding of the dynamics of human behavior and the relationships between educational and vocational choices and personality needs.

The overall effectiveness of vocational guidance depends upon the understanding of the occupational requirements, the occupational opportunities and the importance of such education to individuals and to society in general. The business and industrial community also must be included in the orientation and implimentation of this knowledge. Establishing an occupational guidance program without considering business and industry will ultimately create a vacuum in communications.

With this introduction we are ready to discuss the community action plan in which counselors can be instrumental. The guidance counselors in most communities are aware that student opportunities for self understanding and career planning in vocational education are inadequate. A large percentage (about 30%) of our young people are dropping out of high school. Of those who graduate, many of the best qualified are not continuing their education. Most of the drop-outs and many of the graduates are drifting into, rather than planning careers. The most important area and service that students and counselors need is the assistance of business and industry on a professional basis. In most communities both counselors and students need and desire a greater degree of understanding of the local economic base as well as the national economic base.

Serious consideration needs to be given to solving this problem on a local, regional, and statewide basis. Leaders from business, industry, and education should move in a positive direction to form an association which might be called the (ABIEC) association of business, industry, and educational counselors. From this type of organization, cooperative efforts will assist in solving the communication problems. A mutual understanding of common problems between the training institutions and the user of our graduates could be effectively welded into a uniform association to solve the problems for the youth of the community. Counselors must take the initiative to organize such an association. The success of the vocational program and the implications for guidance personnel can best be defined relative to the relationship with the local business and industry climate. The greatest and most effective public relations program can be developed by mustering the resources of the business and industrial community. Very little has been done to involve the work-a-day world people and educators in solving the problems of guidance. Guidance counselors may ask themselves, "How many award banquets honoring outstanding students in vocational and technical education have we attended in the past year?" By the same token we may ask business executives how many have been invited to attend such award banquets and dinners. In a recent study we found that many of the business community leaders were not aware of such functions taking place in their communities. Communications between the school and the community seems to have broken down and needs to be revitalized if the guidance program is to become effective.

An association (ABIEC) as mentioned above is not projected as a cure-all, but as one approach of solving a problem to meet the needs of students, and simultaneously solidifies relationships between the business and industrial community and the educational community. An organization as mentioned would hold regularly scheduled monthly meetings to discuss the problems and identify solutions to create a better working climate. An association which could operate from a statewide basis would be more practical in that it would involve all counselors and the leaders on a statewide basis from industry and business. It may be that we would like to have statewide meetings once or twice a year involving all segments of the citizenry of the state to become acquainted and attack the problems of guidance in vocational education. The real need in vocational guidance is to bring more active and recent data to the prospective students or the graduate.

An effective method of improving the guidance service in a community is to have a series of training sessions with counselors and representatives from business and industry. School administrators should understand the purpose of the sessions and not only approve, but should take an active part as time permits. Through mutual efforts, the program for a year should be prepared and approved as the associations' activities for the period. The association should prepare the total activities calendar on a yearly basis. The purpose and objectives of the yearly program are to prepare techniques to improve relationships between

the school and the industrial community. The over-all purpose is intended to help guidance personnel to guide youth in the community more effectively.

A typical program for such a meeting may be as follows:

The Program

Purpose: To keep guidance counselors adequately informed of the job opportunities for youth in their region, and of the skills and knowledge required to enter and progress on these jobs satisfactorily.

Meeting Place: Arrange for use of industrial, business, and school facilities where career opportunities, methods, and conditions of employment may be discussed. Sessions should not exceed two hours. They may be held afternoon or evenings. The secretary of the association should publish a formal report of each of the meetings and send the results to all members. Announcement of the next meeting should be made at the close of each meeting, and a follow-up notice of the next meeting should be sent to the members seven days before the meeting.

Planning: Each workshop should be a joint responsibility of business, industrial, and school guidance directors, and official business hosts. Programs should be formal, not social– make use of panel discussions, symposium, etc. Each workshop should include personnel from the regional economy: manufacturing, merchandising, utilities, banking, communication, transportation, health agencies, and government. The total number of sessions will depend upon the economic complexity of the community and region.

Typical Two-Hour Program

2:30 PM – Guidance personnel released from school duties

3:00 PM – Association meets at predetermined meeting place (business or industrial plant)

3:00 to 3:15 PM – Presentation by local official of business or industry. Covers employment, hiring policies, job entrance requirements, opportunities, future manpower needs and company benefits, etc.

The following are a few ways in which a mutal working relationship might produce results for the vocational and technical program in the community and the state:

a. The committee should make a study of the vacant store windows which should be utilized to display students' work and other projects of interest to the general public; such displays should

be changed periodically. This assignment may be delegated to the distributive education students, the commercial art students or to some type of an occupational club within a school.

b. The association with the outstanding leaders from government should be involved to assist in providing space in train and air terminals, lobbies of banks, hotels, and chamber of commerce offices for displaying products and occupational information pertinent to the vocational-technical program.

c. There should be a continuous flow of information from the industrial climate in the community to the school and its vocational guidance programs. Almost everything that happens to vocational students or technical students should be checked for news value. Radio and television programs should be developed cooperatively within the association and should be regularly scheduled fifteen minute programs on a weekly basis.

d. Display cabinets can also be effective during open houses and other events which bring about public involvement in the school. The same displays can be utilized on off-campuses for such community projects such as fairs, and other types of public gatherings.

e. A newsletter is a friendly way to remind the people of the community or region relative to the activities of the vocational and technical program. A short newsletter is much more effective and will bring about better results than a single lengthy one. The mailing lists should include all high school counselors, and principals, potential students, local and regional school offices, and the employment directors of local industry, and a few selected individuals who are identified in the power structure of the community.

f. From the standpoint of reaching the people in the community and with an association backing we could develop effective plans for open houses for the community. Included in the open house may be technical displays and active demonstrations should be of general interest. The open house should be of the nature not to show the parents what their children are doing in school, but to encourage them to see the value of vocational and technical education training programs.

g. Literature in large quantities distributed to many segments of the community is of little value. Literature developments should be more directive and the audience should be pinpointed to get the greatest return for the investment.

h. Local guidance counselors should cooperate with the industrial and business community to plan tours to introduce groups

of vocational and technical students to the world of work and to relate how the training is of value and will benefit the individual and the community.

i. The association may wish to develop a series of seminars to be conducted in industry or business o r on the campus and these should be for two purposes: to provide for a mutual exchange of information from the school to the work community and to provide a better communication between the student and the world of work.

j. An awards banquet should be held, and recognition should be made to outstanding advisory committees and to business and lay leaders who have made major contributions to the betterment of vocational education. These awards or certificates should be presented by some individual in a position of prestige and stature.

k. Another technique is to have a Sunday or weekly supplement that could be developed at least once a year to highlight the activities of the association. The editors of the newspaper should be informed regularly of the changes of curriculum and outstanding achievement.

l. Floats may be prepared by students in vocational and technical education depicting outstanding training programs and should be entered in various community parades. The cost for financing such activities could be solved by the state association.

m. Special radio and television documentaries should be encouraged. If we involve the business and industrial community these could be worked in cooperatively with the training program to acquaint the community area and the implications for the school in developing programs to meet these needs. Everyone enjoys hearing and seeing an alert youngster tell about his training for work and with proper programming this could be an effective form of public relations.

n. Selected students should plan for interviewing prominent businessmen who are graduates of vocational and technical schools and these may be presented on tapes, either radio or television.

o. Complimentary copies of the yearbook should be sent to business and industrial leaders. A first class covering letter from the guidance director or the director of vocational and technical education should accompany the yearbook.

p. The association as mentioned previously in this presentation should meet regularly as small luncheon groups to bring together those people who have a sincere interest in the

educational programs and at this time plot a course of action that will yield results in solving the student problems.

The association of business, industry, education, and guidance counselors is just one way in which we can strengthen the relationships between the world of work and the educational community. If we are to be successful in meeting the needs of students we need to move now if we are going to be creative in establishing a program of good vocational guidance. I say the challenge is, can we in vocational education provide training and education for all the children of all the people–or is it just some kind of a statement for the purpose of dreaming in some kind of limbo? Can we attain in a practical way an association which insists on the cooperation of business and industrial community with educators and in a democratic manner to achieve the goal of developing all persons to their maximum potential ability? We profess to do this–we are committed to it, but again I ask are we accomplishing it? The serious question and challenge is: Can we attain such a goal as to provide the individual student of this state and nation the training and education to urge him to put forth all the energy he is capable and willing to exert?

Can guidance personnel be successful in assisting in matching people with jobs in a democratic way in this country? Can we match students as adults with jobs in a framework of freedom of choice?

Are the communities responsive to the educational and training needs of all persons who need it and can profit by it? Are guidance counselors really aware of the nature of the world of work and its implications for youth in the community?

Can we as educators provide the training for all kinds of jobs from the least skilled to the most technically skilled and professionally demanding? Are we involving those of the world of work as we identify the nature and scope and complexity of the occupations expanding in our industrial complex. The last challenge may be: Can we establish an association from business and industry and educational counselors which will involve the public and private sectors in a community and state and accomplish the educational goals which we are expected to carry out in education and vocational education programs today?

Counseling and Technology Workshop Participants

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Mrs. Mildred Bock
Counselor
Brandywine High School, Niles

Mr. Robert Bovee
Director of Guidance
Crawford AuSable Schools, Grayling

Mrs. Marjorie Brice
Counselor
Whiteford Agricultural School
Ottawa Lake

Mr. Max Evans
Director of Guidance
Lincoln High School, Warren

Mr. Timothy Guest
Counselor
Hudson Area High School

Mr. Harol Haskins
Counselor
Saranac Community High School

Mr. Gary Hershoren
Counselor
Monroe High School

Mr. Clinton Heyd
Director of Guidance
Baldwin High School

Mr. Richard Janke
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South High School
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Mr. John Lucas
Counselor
Loy Norrix High School
Kalamazoo

Mr. Walter Pakulski
Counselor
Mason High School
Erie

Mr. Richard Raby
Counselor
Napoleon Public Schools

Mr. Tom Ramquist
Counselor
Central High School
Kalamazoo

Mrs. Francene Smith
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